

# MUNICIPAL JOURNAL AND ENGINEER

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VOLUME XIII

NEW YORK, AUGUST, 1902

No. 2

## THE CITY OF GRAND RAPIDS

**"The Furniture City"—Commercially Prosperous—  
Fine Lighting and Water Plant—An Unexcelled Gar-  
bage System—The Next Meeting Place of the League  
of American Municipalities**

*By the Editor*



Mayor Palmer



Ex-Mayor Perry

"THE biggest city of its size in this country," is what the late James G. Blaine said of Grand Rapids. When the growth of its population and commercial assets are considered this statement does not sound like an exaggeration.

The city was incorporated in 1850 with a population of 2,686; the enumeration at the last census ran the total up to 87,565. In 1890 Grand Rapids was 46th and in 1900 it had gained two points and is now the 44th city according to size. During the last decade, while Minneapolis increased in population at the rate of 23 per cent.; Buffalo, 37.8 per cent.; Pittsburgh, 34.7 per cent.; Detroit, 38.7 per cent.; Milwaukee, 39.5 per cent., Grand Rapids increased 45 per cent.

### COMMERCIAL ASSETS

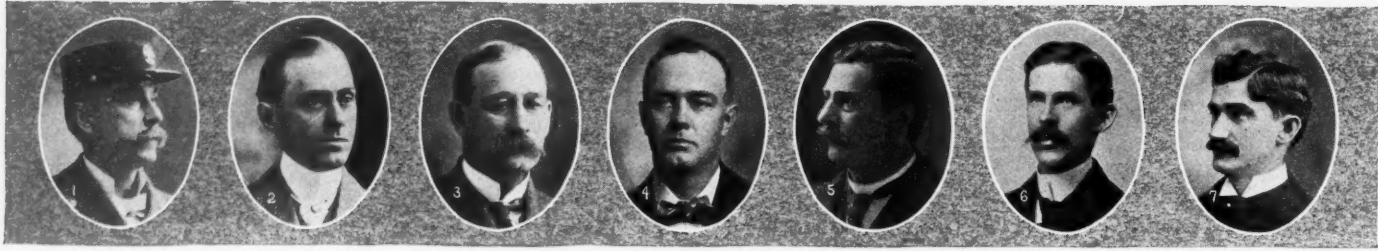
The city is a manufacturing and railway centre, second only in the state of Michigan to Detroit. Over the twelve lines which radiate from the city more than forty passenger trains arrive and depart daily. The railway service, both passenger and freight, is of the best. Among the lines entering Grand Rapids are the Lake Shore and Michigan

Southern; Michigan Central; Detroit, Grand Haven and Milwaukee; Grand Rapids and Indiana, and Pere Marquette. During the last year the freight business amounted to more than 3,500,000 tons.

The distinguishing commercial characteristic of Grand Rapids is found in its furniture industry; hence its name, "The Furniture City." Grand Rapids furniture is known the world over. In this line alone it has an invested capital amounting to over \$3,000,000 and an army of about 10,000 employees. The output during the last year amounted to something like \$10,000,000. More than one-seventh of the output of the furniture of the entire country is manufactured in this city. While it has gained a reputation for making furniture, it is by no means the only industry. For instance, one carpet sweeper factory makes about 90 per cent. of the world's supply, and a second one makes the greater part of the remaining 10 per cent. "Tangle-foot" fly paper had its origin in Grand Rapids, and is sold throughout the civilized world. Fifty per cent. of the felt boots marketed in



CITY HALL



1. Henry Lemoin, Fire Marshal; 2. Dr. T. M. Koon, Health Officer; 3. John H. Hosken, President Common Council; 4. L. W. Anderson, City Engineer; 5. Joseph Emmer, President Board Public Works; 6. Benn M. Corwin, President Board Education; 7. Leo A. Caro, City Comptroller.

the United States and Canada are made in Grand Rapids. There are not far from 500 manufacturing plants located in Grand Rapids, with an invested capital of nearly \$20,000,000, and about 20,000 employees with a pay roll of \$30,000 per day.

#### ITS MUNICIPAL GOVERNMENT

But it is the civic, and not the commercial, side which is of interest to our readers. Last spring the unexpected happened and landed a Republican in the mayor's chair. The regular nominee was stricken with typhoid fever the day after he received the nomination and he died just three days before the election. W. Millard Palmer, Esq., chairman of the Republican committee, and a prominent young business man of the city, was placed in nomination and elected. Mayor Palmer, although it is his first experience in office holding, has made

officio member of the board. It has supervision over the water and light plants and the engineering department. This board appoints the heads of departments under its charge. All contracts for improvements are made with this board, subject to the approval of the Council, before being signed by the Mayor. The street cleaning is managed by three highway commissioners, each being assigned a particular district. There are three Austin horse street sweepers and a few "White Wings" kept at work. While the system is a bad one it is fairly efficient, but a well organized department with a single head would doubtless give better results for less money.

#### MAYOR PERRY'S ADMINISTRATION

Citizens of all classes agree that George R. Perry has been a "strenuous" mayor during the past four years, hence he is given the credit



THE ZOO IN JOHN BALL PARK



A PEEP IN LINCOLN PARK

a good beginning, and already demonstrated his ability to manage the affairs of the city satisfactorily. Without doubt he will carry on the work of general civic improvement so well begun by his predecessor. The city charter is imperfect in many respects and needs a thorough revision. For example, the mayor is paid only \$1,200 a year, and is expected to devote a sufficient amount of time to the discharge of his duties to insure an economical and satisfactory administration. In view of the fact that great responsibilities are placed upon the mayor, he should be paid a respectable salary—at least \$4,000 a year—and required to devote all his time and attention to the city's business. The mayor is elected for a term of two years and is invested with veto power. He appoints the members of the Board of Public Works, Police and Fire Commissioners, members of the Board of Health, the Assessors, Poor Commissioners, and other important officials. His appointments are absolute and do not require the confirmation of the Council. He also appoints all the standing committees of the Council.

The most important department of the city administration is the Board of Public Works, which is made up of five members. The mayor is an ex-

of bringing about greater improvements to the city than were ever secured by any of his predecessors in the same length of time. Among the improvements are to be noted the establishment of a municipal electric light plant, a garbage crematory, improved streets, improvements in park system, the introduction of meters in water works, and many others of minor importance. No one disputes the fact that he has given more time and consideration to the business of the city than any mayor the city ever had. The bonded indebtedness of the city on the 1st of May amounted to \$1,902,000, including the indebtedness of the water works, which is much less than at the beginning of his administration.

Mayor Perry has also been successful in reducing the amount of city taxes. For example, twenty-eight descriptions of property located in different wards of the city, were selected and the amounts of city taxes paid upon these pieces of property during the years 1894 to 1897

inclusive—preceding the administration of Mayor Perry—and for the years 1898 to 1901 inclusive, were tabulated. It was found that in only three instances were the taxes greater in Mayor Perry's administration than during



1. Marcus A. Frost; 2. Isaac F. Lamoreaux, City Clerk; 3. Elizabeth Steinman, Librarian; 4. Barney Meyers, Superintendent Water Works and Lighting Plant; 5. Harvey O. Carr, Superintendent Police.



the preceding four years. This fact, of all others, speaks eloquently of the economy of the administration.

While Mayor Perry is a Democrat he was nonpartisan in his appointments. He has set an example of nonpartisan rule which is worthy of imitation by other chief executives. He expresses the belief that any mayor, no matter what his politics, who does not recognize the existence of his opponents by appointing to some responsible position those who were opposed to him in politics, would be recreant to the trust imposed in him by the people. Because of rigid adherence to this principle he was criticised quite as often by his own, as by the opposing, party.

#### HIS INTEREST IN PUBLIC OWNERSHIP

Mayor Perry became a charter member of the League of American Municipalities, which holds its sixth annual meeting in his city this month, and sought to advance its interests, believing that he could thus better the civic conditions not only in his own, but in other cities. He had not long been a member of the organization when he became a convert to municipal ownership. After a thorough investigation of the subject he was convinced that what was good for other cities would be good for Grand Rapids. For this reason he sought to improve the conditions of the water works plant already established,



THE POST OFFICE

and to bring about the installation of a municipal lighting plant. His wish was realized when he became mayor, and now the city has one of the best conducted city lighting plants of its size in the country.

Early in his administration he discovered the great waste which was going on in the water department and sought to check it. At his solicitation the Board of Public Works made thorough investigation along this line, and it was estimated that 60 per cent. of the pumpage was wasted. He believed that this was largely due to leaking service pipes, careless householders, and other needless waste. He believed that it could be reduced to a minimum by the introduction of meters upon domestic service. Upon this point he expresses himself as follows: "I believe in the placing of a meter on every service. I believe that it is the most economical system in existence, not only for the individual, but for the consumer as well. Then the city assumes no risks and no control over the plumbing over the property line, and it is optional with the consumer if he will repair the plumbing or let it leak. So long as he pays for the water it does not matter which he does, but you will soon find that the owner will be his own inspector, and it will not be long before he has the leaky pipes repaired."

#### WATER DEPARTMENT RECEIPTS

The total receipts for the water department for the



THE UNION PASSENGER STATION

past year have been about \$109,000, of which \$104,500 come from water rates. The remainder was collected from plumbers' licenses, inspectors' fees, material sold, etc. The water rates amounted to \$4,500 less than during the previous year, due to a reduction of meter rates, and to the fact that there was very little in delinquent rates to collect during the past year. The interest and exchange paid during the last fiscal year amounted to \$39,261. The total amount paid for the operation of the pumping station was \$32,393; for maintenance and distribution, \$10,135; office salaries and expenses, including books, blanks and advertising, \$4,821; for the inspector's department, \$4,429, and on the construction account, \$14,853, the total expenditures being approximately \$106,000.

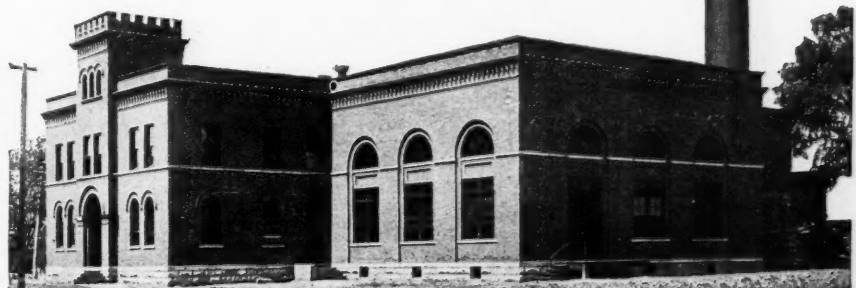
The cost of coal used to pump each million gallons of water has been reduced about fifty cents during the past year. The "Crown" meters, made by the National Meter Company, are used in this department.

#### THE LIGHTING PLANT

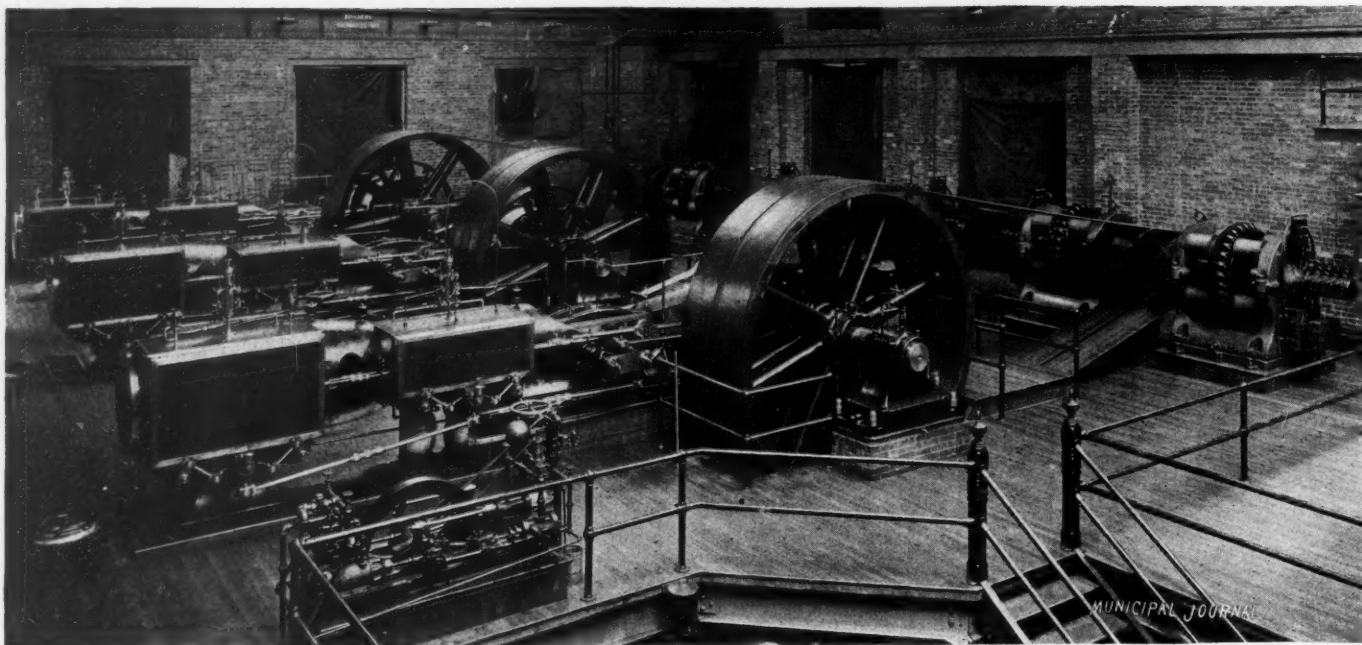
The citizens of Grand Rapids are justly proud of their lighting system. The electric light and water works plants are under the general supervision of Mr. Barney Meyers. The lighting plant is equipped with three Russell engines, Conover condenser, a Green economizer, with general electric dynamos of the multi-circuit type, 550 Adams-Bagnall enclosed arc lamps. The conduits for laying the wires underground in the business section were supplied, and the entire construction performed by the Chase Construction Company, of Detroit, Mich.

#### COST OF CITY LIGHTING

The first contract for the lighting of Grand Rapids was made with a private company in the year 1892, when \$150 per arc lamp per year was paid. The cost for 300 arc lamps in 1892 and 1893 amounted to \$45,253.69. In the succeeding two years the number of lamps was increased to 350 and the total cost per year amounted to \$51,882. The last year of this contract, closing in 1895, the amount had crept up to \$55,723. At this time the price was re-

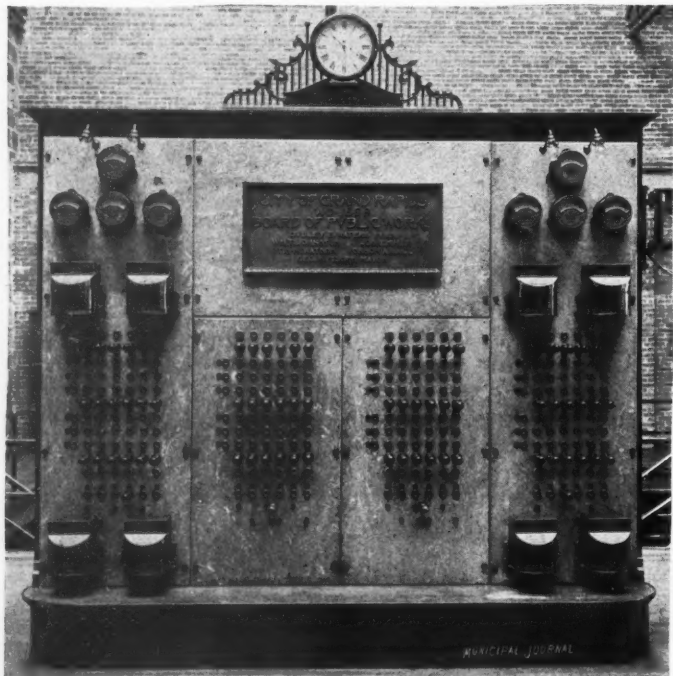


POWER STATION OF MUNICIPAL LIGHTING PLANT



RUSSELL TANDEM COMPOUND ENGINES IN MUNICIPAL LIGHTING PLANT

duced to \$107 per year per arc lamp. The number of lamps had to be increased continually, and the last year of lighting under private ownership cost the city \$44,480 for 404 lamps. During the past year the city had the benefit of 525 lamps



SWITCHBOARD IN MUNICIPAL LIGHTING PLANT

at an expense approximating \$20,000, less than half what it formerly cost under private ownership. Adding the interest on the investment, taxes, and depreciation would bring the cost per arc lamp per year up to about \$60.

#### THE HEALTH DEPARTMENT

There are few health departments in the United States which will compare favorably with the one operating in Grand Rapids. The health officer is charged with the usual responsibilities. The garbage is collected under private contract and has in use a system which is unexcelled by any other city, regardless of size. From three to six times a week in the downtown districts and two to three times a week in the outlying residence streets, garbage is collected. The wagons leave the barns at six o'clock in the morning, each wagon being loaded with cleaned and sterilized cans. Each driver is numbered and

charged with cans enough to cover his route, the cans are numbered with the same numbers as the driver, so that they can easily be traced in case any inefficiency is reported. At each stopping place on his route the driver leaves an empty sterilized can and collects the full ones. Each driver is supposed to collect from 1,200 to 1,500 cans per week. The loaded wagons are driven to the crematory and emptied, the uncleaned cans exchanged for cleaned ones, and so on in rotation.

A card with the streets and number of each driver's route is kept in the health office, the driver carrying a corresponding route book, so it is possible to locate all wagons at all times in case of trouble and permit the responsibility to be placed where it belongs. This system has now been in use for four years and has given perfect satisfaction.

#### THE DESTRUCTOR PLANT

The crematory has a double burner of the Engle pattern, each side having a capacity of fifty tons per day. The furnace is constructed of fire-brick blocks made of Pennsylvania fire clay. The grate-bars used in the furnace are of the same material.

The furnace is built on scientific principles and does not require a forced draft of any kind. Two fires are kept burning on each side, one in the centre and one in the end of the furnace. The flame from the centre, or main fire box, passes over the garbage that has been stoked into a pan and under the garbage that is on the grate-bars, thereby drying the freshly added garbage while consuming that which has been stoked down by the fireman. The flame from the main fire box meets the flame from the end fire box, thereby changing its course and in its return passing over the garbage on the grate-bars. This flame then passes to a back chamber at the extreme other end of the furnace where a small fire is kept burning, which



PUBLIC LIBRARY—NOW BUILDING



consumes all gases as the heat passes out under the pan containing the stoked garbage to the stack. This arrangement, while very simple, is effective and consumes every particle of garbage deposited in the furnace.

During the past year 13,624 tons of garbage were consumed, 704 dogs, 33 horses and 8 cows. The total expense for running the crematory for the year amounted to \$5,705.40. This sum included \$2,602.59 for labor; \$2,016.36 for fuel; \$837.31 for repairs, and \$249.14 for miscellaneous expenses. Omitting the expenses of the repairs it cost 29½ cents per ton to consume the garbage of the city; 41.1 cents per ton including all the items of expenses for running the crematory.

#### STREET PAVEMENTS

There are few cities of the size which have a larger variety or as fine a lot of pavements as may be found in Grand Rapids. This is largely due to the progressive methods which have been put in force in the city's engineer's department. Last year more than \$150,000 were expended for street improvements. This includes the money expended for gravel, macadam, brick, asphalt block, sheet asphalt and Portland cement concrete pavement. Last year a special effort was made to reduce the voids in the gravel by using a mixture of fine gravel when necessary. This has materially reduced the amount of clay binder. The macadam pavements are laid under contract and the ordinary methods of construction are followed.

Brick paving retains its popularity for business and manufacturing districts. A special effort has been made to secure a smooth surface. To this end the sand cushion was increased in depth, a soft, fine sand being used. The brick were rolled first after being laid, with a hand roller, then thoroughly culled, a seven-ton steam roller being used for

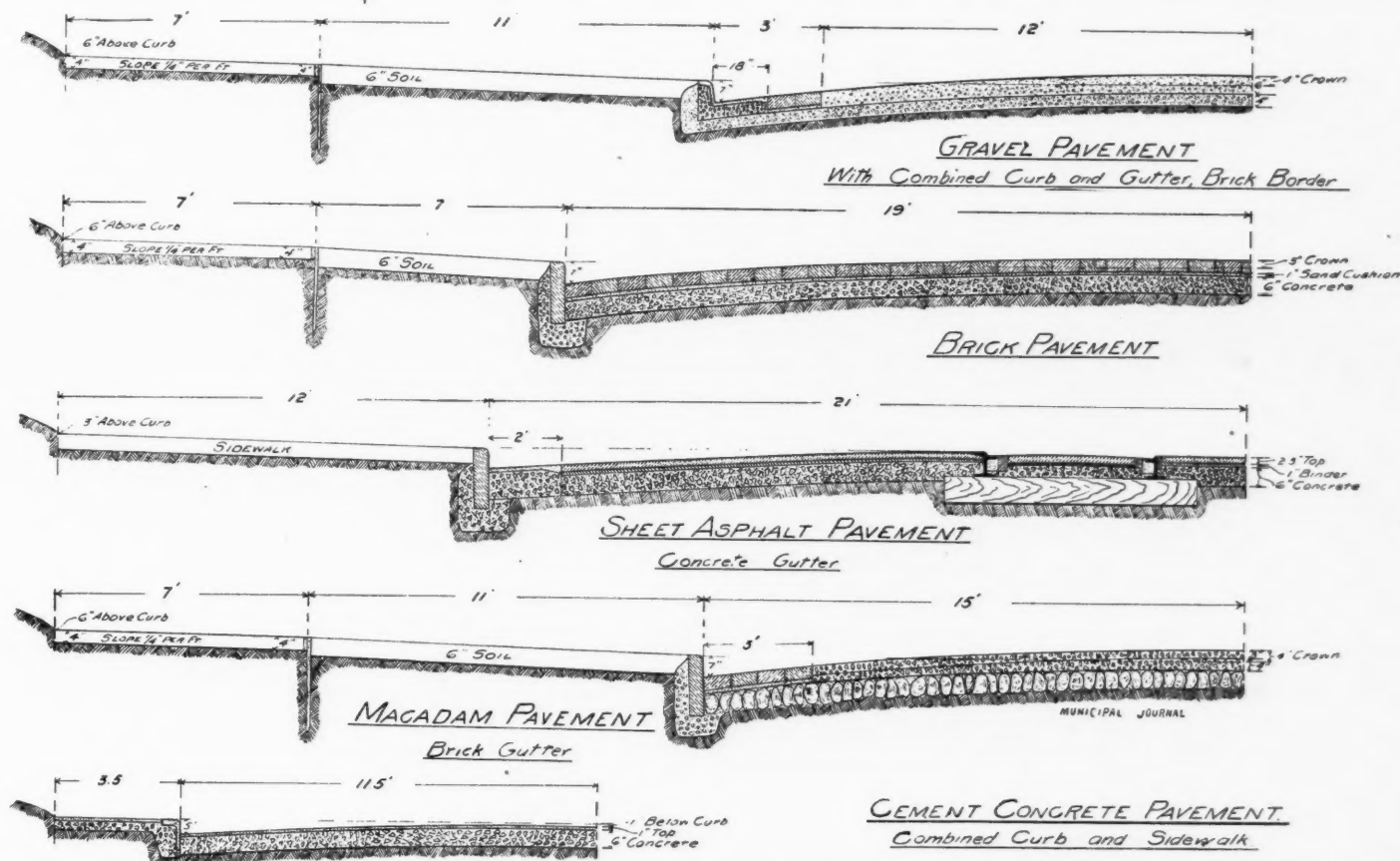


CANAL STREET PAVED WITH TRINIDAD SHEET ASPHALT IN 1900—BRICK BETWEEN TRACKS  
—CONCRETE GUTTERS

the final rolling. It was feared that the heavy roller would chip the brick, but this did not prove to be the case. Portland cement grout was used as a filler. Last year Nelsonville, Buckeye, Massillon, Metropolitan and Harris paving bricks were used. The first mentioned, according to the city engineer's report, proved to be unusually uniform brick. The others, except the Harris, required only the usual amount of culling.

#### ASPHALT PAVEMENTS

The asphalt block pavements in Grand Rapids present as fine an appearance as anyone would wish to see. One street was paved in 1900 and the other in 1901. City Engineer Anderson expresses the



CROSS SECTIONS SHOWING MANNER OF CONSTRUCTING VARIOUS PAVEMENTS

belief, based upon observation, that the blocks should be laid before the latter part of August so that the edges may become thoroughly united to protect them from the excessive chipping which some times occurs.

"Heretofore it has been customary," said City Engineer Anderson, "to improve the courts with tar concrete on a cobblestone foundation. The departure was made from this practice during the year in the construction of a Portland cement concrete pavement in one of the small courts.

"Briggs Court, the one improved, has a width of thirty feet, twenty-three feet being allowed for the roadway, which was given a four-inch crown, with a curb exposure of five inches. The upper end of the roadway was enlarged to a thirty-foot radius to permit the turning of teams. The work has been very satisfactory



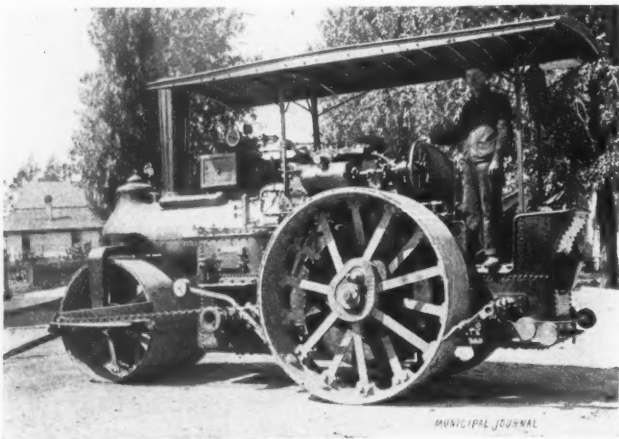
ASPHALT BLOCK PAVEMENT LAID BY THE LAKE ERIE ASPHALT BLOCK CO., OF TOLEDO, O.

to the people on the street."

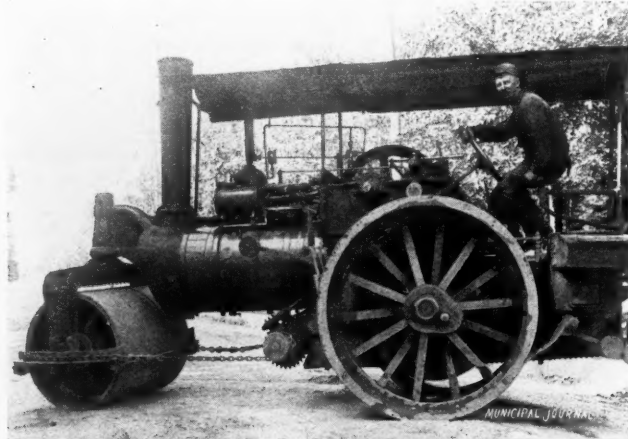
#### BITUMINOUS MACADAM

In a recent communication to the Board of Public Works, City Engineer Anderson said: "I desire to call your attention to the bituminous macadam pavement constructed by the Warren Brothers Company of Boston. While there are patents covering the bituminous mixture I believe it advisable to give the pavement a trial on some hill street in Grand Rapids. I examined the pavement on Harvey Street, Pawtucket, R. I., where one block of the street has a 12 per cent. grade. Adjacent streets

with ordinary macadam were badly cut by the heavy rains occurring previous to my visit, but Harvey Street was not injured in any way, although there were no brick or stone gutters. Similar conditions were noted on several streets in Pawtucket and Cambridge, Mass.



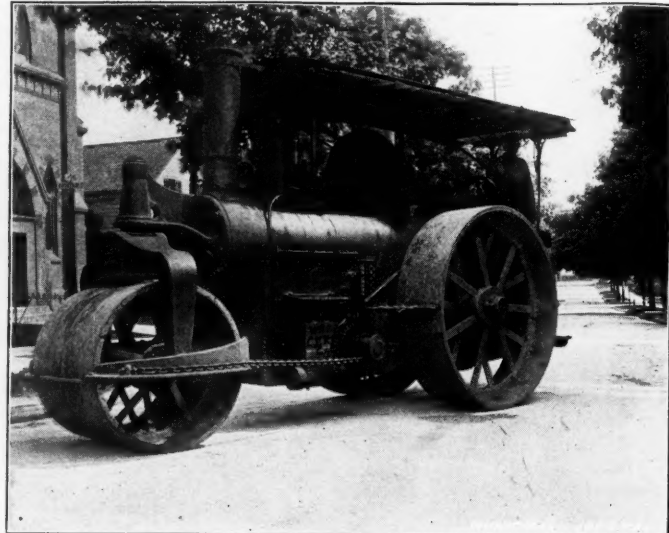
THE RUSSELL ROLLER



THE HARRISBURG ROLLER



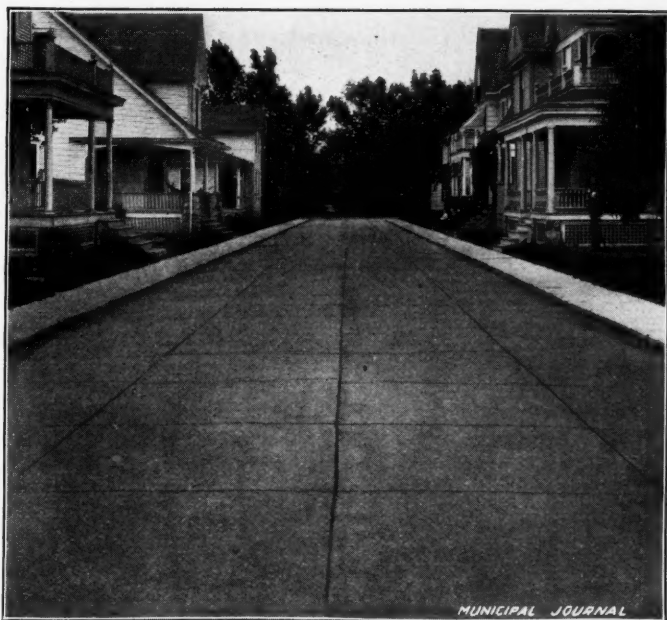
THE SCHOLL ROLLER



THE KELLY ROLLER

**A Part of the Equipment of the Engineering Department**





PORTLAND CEMENT CONCRETE PAVEMENT

"The pavement consists practically of a bituminous concrete, the ingredients being heated, mixed and spread as in the construction of sheet asphalt pavement. The direct and essential difference lies: (a) in the use of coarse and fine particles of sand so graded as to reduce the voids to the smallest possible percent; (b) in the use of the heaviest type of macadam roller in place of the tandem roller used on asphalt pavement.

"The construction of the asphalt pavement consists in the use of sand grains graded to reduce the voids and supported by an asphaltic cement. The sand grains in themselves having no firmness, the pavement gradually disintegrates when the asphalt losses its cementitious qualities.

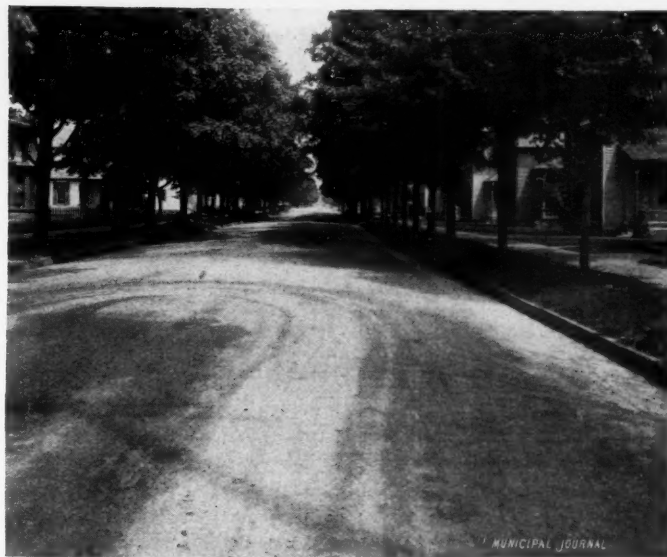
"The construction of the bituminous macadam is based on the principle that the coarse stone, with its voids thoroughly filled with finer particles, will, in itself, have a firmness and strength to resist the effects of travel. If to this is added the bituminous cement sufficient to bind the particles together to prevent the pavement breaking

under travel, and form an elastic cushion to protect the pavement from water and the atmospheric changes, then should result an ideal pavement, possessing the qualities demanded for a residence or business street.

"A pavement constructed along the lines outlined above is even less noisy than asphalt, affords a foot-hold for horses equal to macadam, is comparatively dustless, as it can be swept clean, the common raveling of the macadam being prevented by the bitumen."

## PUBLIC LIBRARY

Although Grand Rapids opened a public library as far back as 1858 it has never had a building of its own. For a number of years past it has been located on the second floor of the city hall. Its growth has been somewhat retarded because of these conditions. At the



A MACADAM PAVEMENT

present time it has total of 58,132 volumes, including fiction, reference and medical works.

Although the quarters have been cramped and inadequate to the needs, the librarian, Miss Elizabeth Steinman, has shown great skill in making the best possible use of the space at her command. Last year a juvenile department was opened, the success of which has thus far proved very gratifying.

Not long ago Martin A. Ryerson, of Chicago, formerly a resident of Grand Rapids, agreed to erect a library to cost about \$300,000 provided the city would procure a site. It is needless to say that the proposition was accepted immediately. The contract for the building has already been let and it will be completed in about two years.

## COMPTROLLER'S DEPARTMENT

The voters of Grand Rapids have shown rare good sense in repeatedly electing the same man for comptroller—Leo A. Caro, Esq. Although a Democrat in a Republican city he has been elected five times and is now serving his fifth term, which, when completed, will round out a period of ten years that the comptroller's office has been under his supervision.

While Mr. Caro has been hampered in many ways, through his wise management he has been enabled to inaugurate some reforms in the municipal accounting of the city. Two years ago a new



THE CITY MARKET AT FIVE O'CLOCK

system of accounting was installed, which, up to the present time, has given satisfactory results. In a recent communication to the City Council he suggested that the city charter be so amended as to require the comptroller's books to show a detailed account of the receipts of the various departments so that the self-sustaining departments may be reported in due form, something which cannot be done under the present system of accounting.



ONE OF THE TEN ENGINE HOUSES

A thorough detailing of the expenses of the departments and frequent reports from the auditor's office will have a tendency to deter lavish and unnecessary expenditure, for if there is anything that the average politician fears it is public criticism.

Mr. Caro further suggests that the collection of public moneys should be concentrated in one department. At present public moneys are paid to several different departments. It is a round about way for arriving at the same end. The present practice requires each department to report to the comptroller daily the amount of money that has passed into the treasurer's office through its department. The following day the treasurer reports to the comptroller the amount he has received which must agree with the department reports. Licenses, deeds and receipts of all nature, are issued by the departments only on a proper receipt from the treasurer, and these different departments know what money they should be credited with, and the treasurer must agree with them. Every month the stubs of the books of the department are checked off and thus errors and defalcations are reduced to almost an impossibility.

The comptroller's books show a daily balance that is as accurate as any bank books can be, and if the suggestion of the city comptroller is followed, further improvements will be made. Here, as in other municipalities, the authorities are hampered by coming in conflict with the state laws and with charter amendments forced on them by men unfamiliar with the needs of the city. Strong hope is expressed

by many leading citizens that the State Legislature may be induced to accord a greater degree of home rule not only to Grand Rapids but other cities of the state. One thing is certain, that better municipal government would prevail among the Michigan municipalities if the state would keep its hands off from local affairs and not resort to the "catch penny" partisan methods.

#### FIRE AND POLICE DEPARTMENTS

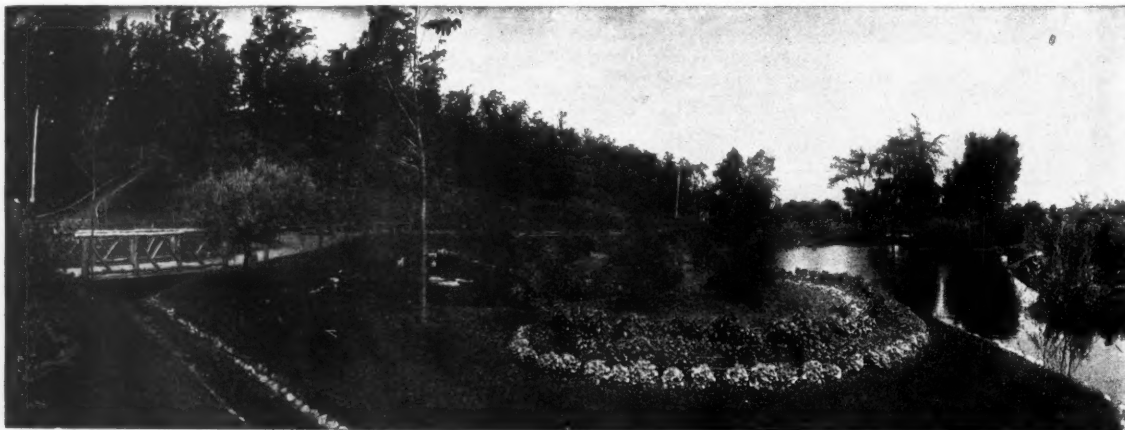
Grand Rapids has an excellent public school system, and its kindergarten and industrial schools are exceptionally good. They are all liberally supported and the affairs of the Board of Education are wisely conducted. The police and fire departments of the city are second to none in the country, when all things are taken into consideration. The departments are liberally supported and they do very efficient work.

The City Clerk's office is admirably conducted. There is a place for everything and everything is in its place. The proceedings of the Council are accurately recorded and published regularly in pamphlet form. The only thing needed is a book-typewriter.

The street car and telephone services are excellent. A noticeable feature of the former, maintained by the postal and street railway authorities, is the street car letter drop box. Attached to the dashboard, at each end of each car, is a standard letter box for the reception of outgoing letters. The arrangement with the street railway officials provides that at specified street crossings, upon signal, the car will stop for the posting of such mail as will pass in the ordinary box. At a central point collectors gather the mail and forward it at frequent intervals to the general post office. In this way a letter can be posted anywhere on the fifty miles of the street railway system and be started towards its destination almost as quickly as though mailed at the main office. There are also, of course, regular United States street mail cars which are found in other cities.

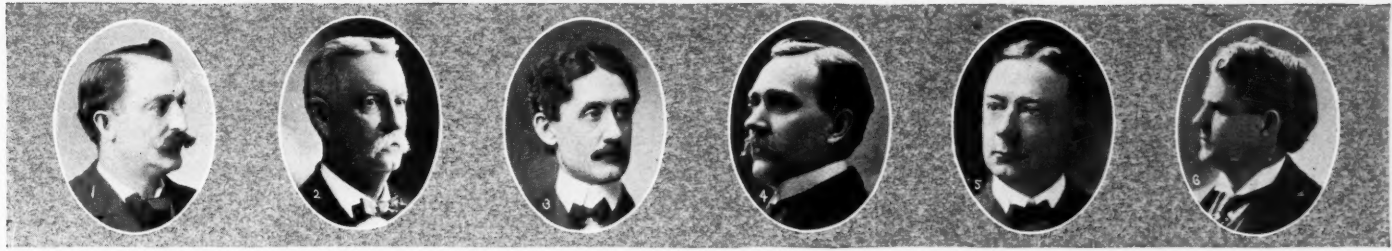
#### SOME OF THE CITY'S NEEDS

Public baths, and public playgrounds are needed. The sewer system is not adequate to the demands, as out of the 290 miles of streets there are only 125 miles of sewers. The street cleaning department, while it does fairly good work, is inadequate. It should be thoroughly reorganized and placed under the management of a single superintendent, following the custom in most other cities. Better results would thus be achieved than by a continuance of the present three commission system. The greatest need, however, is found in the water department. The supply is inadequate and not wholly free from impurities. But the healthy spirit which has already been manifested by the citizens of Grand Rapids is bound to take hold of this question and bring it to a happy solution. There are a few warring elements, as will be found in other cities, but even these are inclined to bury the hatchet and unite in a grand movement for general betterment of the city. It does not need a prophet to see that the next decade will bring a larger number of civic blessings to Grand Rapids than have been received in the past. The tendency is onward and upward.



A VIEW IN ONE OF THE PARKS





1. Charles S. Ashley, President, Mayor of New Bedford, Mass.; 2. J. Adger Smyth, First Vice-President, Mayor of Charleston, S. C.; 3. Richard J. Barr, Second Vice-President, Mayor of Joliet, Ill.; 4. James M. Head, Third Vice-President, Mayor of Nashville, Tenn.; 5. Thomas P. Taylor, Treasurer, formerly Mayor of Bridgeport, Conn.; 6. John MacVicar, Secretary, formerly Mayor of Des Moines, Iowa.

#### Officers of the League of American Municipalities

## LEAGUE OF AMERICAN MUNICIPALITIES

### Meets in Grand Rapids—New York Will Be Represented—Reasons for Joining the League— The Preliminary Programme

LAST year there were over three hundred registered at the meeting of the League at Jamestown, and its programme was most interesting and helpful. This year it is expected that more than four hundred will be registered at the meeting. The official programme has not yet been issued but we give a preliminary programme elsewhere. The subjects and those who have been selected to discuss them are sufficient recommendation to insure a splendid meeting. Every municipality should begin to make preparations at once to attend this meeting.

#### THE OFFICIAL INVITATION

*"To the Honorable Mayor and City Council.*

"Gentlemen: The Sixth Annual Convention of the League of American Municipalities will be held in Grand Rapids, Mich., August 27th, 28th, and 29th, 1902. The programme, so far as arranged,



MORTON HOUSE—HEADQUARTERS OF THE  
LEAGUE

will cover subjects as follows: Transportation and Taxation, The Contract System, Crime and Criminals, Park and Park Commissions, Canadian Municipal Situation, Street and Road Construction, Street Paving and Street Cleaning, Uniform Municipal Accounting, Municipal Ownership, pro and con, Fire Departments, Organized Labor's Relation to Municipal Affairs.

"These subjects will be presented from a practical standpoint by competent officials and experienced engineers of many of the important municipalities of the United States and Canada.

"It has been determined to extend a general invitation to all municipalities, whether or not members of the league, to attend this convention. Your municipality is therefore earnestly invited to send a delegation of city officials to this gathering.

"The League of American Municipalities was organized at Columbus, Ohio, in 1897. Its membership represents the progressive municipalities of the United States and Canada. Its object is to learn and teach the best practical methods of securing improved public service. The League is non-partisan and is committed to no definite policy, aiming to secure and publish reliable information.

"Not only is Grand Rapids an attractive spot for summer outing, being reached by lake as well as rail, but in the conduct of her municipal affairs will be found excellent examples of progress along improved lines. Much of the improvement was inspired by information gained through the medium of the League of American Municipal-

ities, this city having been an active member since the League's organization.

"The city of Grand Rapids exemplifies the results of municipal ownership of waterworks, electric light works and garbage plants, as well as a thorough system of municipal accounting.

"Special rates will be secured over all railway and lake steamship lines. Excursion trains will be run from such points as the attendance will justify.

"Kindly advise the Secretary as early as possible how many delegates will attend from your city. The Secretary will undertake to secure hotel accommodations in advance upon request.

Yours very truly,

(Signed) CHARLES S. ASHLEY, PRESIDENT.

(Signed) JOHN MAC VICAR, Secretary.

"Address all communications to the Secretary at Des Moines, Iowa."

#### SOME REASONS FOR JOINING THE LEAGUE

"The League represents the first and only united effort on the part of city officials in all departments to study the various and complex questions involved in municipal administration with a view to giving their constituents the very best of public service by the most approved methods and at the lowest cost to the taxpayers.

"The League is composed exclusively of city officials, who are in a position to study and discuss municipal problems from a practical standpoint. Real improvement in municipal government must come through the efforts of men whose experience as city officials gives them a correct view of the conditions and obstacles that must be met, and enables them to formulate practical instead of theoretical plans.



GRAND RAPIDS UNION SCHOOL



GRAND RAPIDS SOLDIERS' MONUMENT

"Memberships are held in the name of the municipality, justly at the expense of the municipality, and in this way permanency of organization is assured. Every individual official of a membership city is entitled to the privileges of membership. The annual dues are exceedingly low, and the League gives to the officials of every membership city a service unquestionably worth many times the membership fee.

"At the annual conventions of the League carefully prepared papers on the most important municipal subjects are presented and discussed. The papers and discussions, which are afterwards printed in book form, bring out many original ideas and valuable suggestions for the general improvement of municipal service."

## PRELIMINARY PROGRAMME

- "Address of Welcome," Hon. W. Millard Palmer, Mayor of Grand Rapids, Mich.;
- "Response and President's Address," Hon. Charles S. Ashley, Mayor of New Bedford, Mass.;
- Paper, "Municipal Ownership," by the Hon. J. W. Riggins, Mayor of Waco, Texas;
- Address, "Organized Labor's Relation to Municipal Affairs," Hon. Ignatius A. Sullivan, Mayor, Hartford, Conn.;
- Paper, "A Modern Street Cleaning Department," Hon. D. W. H. Moreland, Commissioner of Public Works, Detroit, Mich.;
- Paper, "Gas Leakage in Cities in Its Economic and Hygienic Aspects," Mr. James E. Bayles, M. E., Ph. D., Ex-President, Department of Health, New York City.
- Address, "What Is Crime, and Who Are the Criminals?" Hon. Samuel M. Jones, Toledo, O.;
- Paper, "Uniform Municipal Accounting," Mr. J. J. McCardy, Comptroller, St. Paul, Minn.;
- Paper, "Municipal Government in Germany; its Success and Why," by Mr. C. E. Campbell, ex-member of Board of Public Works, Des Moines, Iowa;
- Paper, "The Fire Department of Our Cities," Mr. John H. Sirich, member of the Board of Fire Commissioners, Baltimore, Md.
- Address, "How the Modern City Should Be Governed," Hon. Jacob A. Cantor, President Manhattan Borough, New York City.
- Paper, "Public Improvements," Hon. W. M. Drennen, Mayor, Birmingham, Ala.;
- Paper, "Street Paving," B. F. Fendall, C. E., City Engineer, Baltimore, Md.;
- Address, "The Ohio Municipal Situation," Hon. W. B. Doyle, Mayor, Akron, O.;



GRAND RAPIDS POLICE HEADQUARTERS

- Paper, "Transportation and Taxation," Hon. J. M. Head, Mayor, Nashville, Tenn.;
- Paper, "The Contract System," Hon. Thomas G. Hayes, Mayor, Baltimore, Md.;
- Paper, "The Creation and Organization of Park Commissions in the United States," Mr. G. A. Parker, Superintendent Kenny Park, Hartford, Conn.
- Address, "The Canadian Municipal Situation," Hon. W. D. Light-hall, Mayor, Westmount, Canada;
- Paper, "The Gothenborg System of Handling the Liquor Traffic," Hon. J. A. Johnson, Ex-President of L. A. M., Fargo, No. Dak.;
- Paper, "Street and Road Construction," with stereopticon views, Mr. William S. Crandall, Editor the MUNICIPAL JOURNAL AND ENGINEER, New York City.

## ENTERTAINMENT AND HOTEL ACCOMMODATIONS

Although former Mayor Perry, who gave to the League its invitation to hold its next session in Grand Rapids, will not be the official host, the visiting delegates may be sure of a most hearty welcome. Practically, the delegates will have two hosts, the official and the unofficial, the former being Mayor Palmer and the latter Ex-Mayor Perry. Both gentlemen have been working for the success of the meeting, and the new administration, under the leadership of Mayor Palmer, has come nobly to the front, and made most elaborate plans for the entertainment of both the ladies and gentlemen who will be present. A good time is assured for all who attend.

The hotel accommodations in Grand Rapids are exceptionally good, as good as the best in the country, and they are ample. The headquarters of the League have been established at the Morton House, which is a large, modern-appointed hotel, run on the Ameri-



A BUSY STREET IN GRAND RAPIDS

can plan by Mr. J. Boyd Pantlind. Contrary to the usual practice in cities where the League has been entertained, "mine host" of the Morton House has refused to increase his prices, so that the delegates will pay no more during the convention than is charged throughout the year. This is a "fair deal" and one which will be greatly appreciated. The prices given are from \$2.50 to \$4.00. In the same city, a few blocks away, Mr. Pantlind recently completed the reconstruction of a hotel which is known as "The Pantlind," where the European plan prevails and rooms may be secured at a lower rate than at the Morton House. As there is sure to be a large attendance it will be wise for those who are planning to attend this meeting, to engage their rooms at once. Address either the proprietor or Mayor Palmer.

For the first time in several years a delegation will be sent from New York City, headed by the President of Manhattan Borough. Members of the League will be glad to learn that a resolution is now before the Board of Aldermen providing for the payment of the dues of the city for the past four years and authorizing the renewal of its membership. The present administration is taking a lively interest in the affairs of the League and proposes to avail itself of the privileges offered by its membership. Alderman Goodman assures us that there is very little doubt that the resolution will be passed when it comes up for final disposition.



# A PROPOSED MUNICIPAL CODE FOR ITALY

**Municipal Ownership Already Popular—New Code Enlarges Opportunities—Referendum Provided for—A Step in Advance**

*By Prof. Riccardo Bachi\**

DURING recent years the municipalization of public services has gained considerable popularity in Italian cities. The old time notion that the city was the worst possible administrator, and as such should confine itself to a minimum of functions, is now giving place to a new fancy which seeks to intrust to the municipality more extended social functions and wider activities in economic life.

Various economic writers have given the excellent results of this policy in foreign countries. Some years ago this policy was popular only among the most advanced political parties, but now all parties have accepted it, and under the pressure of public opinion numerous cities—chiefly cities of medium size and importance—have assumed the management of public services.

## POPULARITY OF PUBLIC OWNERSHIP

At present we have in Italy about 160 municipal waterworks, more than twenty municipal gasworks, thirty municipal electric light plants, while one of the larger cities owns and operates its electric tramways. A large number of cities of all sizes have municipal markets, slaughterhouses, public baths and public wash houses. Many municipalities pave and clean their own streets, collect and dispose of garbage, and take care of the sewage. As in England, a few municipal oddities are found in Italy. We have some cities which manage theatres, artistic exhibitions, mills and bakeries; others which sell coke, and one which runs a stone quarry; four cities run municipal ice plants, two maintain pharmacies, one has a municipal fishery, and even some of the smaller municipalities buy and sell fertilizer for the improvement of land.

The Italian Cabinet has presented a bill for the municipalization of public service industries. It is an important bill and cannot fail to interest American readers. Before calling attention to its chief clauses it will be necessary to show the difference between the Italian municipality and that of other countries.

## ITALY'S FORM OF CITY GOVERNMENT

According to the civic laws of Italy the enrolled voters of each commune elect municipal councilors who constitute the legislative council. The executive functions are discharged by a municipal board, of which the Mayor is the presiding officer, while the other members of the board are selected from the municipal councilors. The size of the board varies according to the population, and is selected by the Municipal Council itself. Both bodies are presided over by the Mayor. The board sits permanently, and is analogous to a cabinet of ministers, the Mayor exercising supreme control over the entire administration. The different members of the board have charge of some particular branch of service, such as lighting, public works, schools, etc. Every fall the board presents to the Municipal Council the estimates for the coming year, and each spring the accounts of the preceding year, which are discussed and passed upon by the Council.

The most peculiar feature of the Italian municipal government is found in the head of every province—analogous to the American county. This official is known as the Prefect. He has large powers, among others the right to revise all the estimates, accounts and decisions of the Municipal Councils of his province, which includes the right of veto. The Central Government, on the recommendation of the Prefect, in cases of mismanagement, has the right to dissolve the Municipal Council and Board of Commune for a period varying from three to six months, the government taking charge during the interval.

It is evident from this that our municipal government in Italy has very little of home rule. The interference of the Central Government in municipal matters is constant and often oppressive. For these reasons the proposed bill authorizing a new municipal code, introduced by Minister Giolitti is the more acceptable.

## THE PROPOSED MUNICIPAL CODE

The first article permits municipalities to assume the following responsibilities:

(1) The construction and operation of waterworks; (2) The con-

struction and operation of plants for public and private lighting; (3) The construction and operation of tramways and other means of transportation within the limits of the city; (4) The construction and operation of hydraulic or electric motive power plants; (5) The construction and operation of telephone systems within the limits of the city; (6) The construction and operation of bakeries with the power to regulate the price of bread; (7) The construction and operation of public markets; (8) The collection and disposal of refuse; (9) The construction of sewer systems and the treatment of sewage; (10) The regulation of burials and a monopoly on those which are non-gratuitous; (11) The regulation and control of all advertising signs and bill-boards (12) The construction and operation of public baths and wash houses; (13) The construction and operation of slaughter houses; (14) The construction and operation of lodging houses; (15) The establishment of nursery gardens and the sale of nursery stock.

The second part of the bill gives the rules for the management of the municipal services. There is a general provision that every service shall be kept separate from every other in its general administration, taking care of its own estimates and accounts. But when two or more services are of minor importance they can be united in one department. The net profits of all departments go to the municipal treasury to relieve the rates.

## REGULATIONS AS TO ADMINISTRATION

Special rules are laid down for the administration of each department. These regulations include: (1) The qualifications of manager, amount of surety to be given, amount of salary with or without profit sharing; (2) How the committee of management shall be appointed; (3) How many clerks and workmen shall be employed, together with their manner of selection, fixing of salaries and wages, with or without profit sharing; (4) The rules for pensions to retired clerks and other workmen; (5) The manner in which the profits of the department shall be shared by the municipal treasurer, the manager, the clerks and workmen, and for the establishment of sinking and reserve funds; (6) The price and purchase for the use of the service, and the rules for changes thereof.

Each department will be run by a manager, who shall give a bond. He is to be appointed by the Municipal Council for three years, and can succeed himself if desirable. The Council has the power of removal.

Each department is to be supervised by a special committee, the chairman of which shall be an assessor or a town councilor, and it shall consist of three, five or seven members including the chairman, the other members to be selected by the town council. This committee is to be re-elected every third year, and will hold a very responsible relation to the general manager of the department. This committee is to prepare and present to the town council the estimate and accounts of the department. It is authorized to make purchases, contracts, etc., and to appoint and dismiss clerks and workmen.

The committee and general manager are to be held responsible for every damage caused to the department. In certain cases the department can have a special treasurer, but ordinarily their funds will be handled by the city treasurer, who is obliged to keep separate accounts.

No official will be allowed to hold more than one office.

## THE REFERENDUM PROVIDED

The third part of the bill tells how a city may assume these responsibilities. In the first place it is necessary for the Council to vote upon the question, when a majority is necessary to affirm or reject. Not earlier than twenty days after the first vote it is necessary to take a second vote. The action of the Council is reviewed by a special body appointed by the prefect, called the *giunta provinciale amministrativa*. When approved by this body the application of the city is signed by a central committee composed of twelve high officers of various depart-

\* Turin, Italy.

ments of the state and appointed by the Minister of Home Affairs, which gives its judgment on the scheme chiefly from its financial and economic aspects. If this judgment is favorable then the enrolled voters of the commune, or city, are allowed to vote yes or no upon the question. If the majority of the voters are against the proposition it cannot be taken up again within three years.

The fourth part contains the clauses showing how the public services are to be controlled. The estimates of accounts, the expenses which exceed the estimates, and the contracts are to be passed upon by the Municipal Council and the *giunta provinciale amministrativa*. The Prefect or sub-prefect is authorized to review every administrative action and has full power to make such changes as he deems necessary in the interest of the department. Should the advisory committee be neglectful of its duties or mismanage the affairs of the department it may be dissolved by the Municipal Council, and in special cases by the prefect. In such an instance the Council is required to nominate another committee within a month, the department being managed during the interval by the *giunta provinciale amministrativa*.

When the department is conducted at a financial loss or when great irregularities are discovered by a special investigation, the prefect, after advising with the *giunta provinciale amministrativa* and the central committee, can reorganize or abolish the department.

The fifth part of the bill deals with the question of the purchase of private enterprises. Any plant may be purchased at the expiration of its franchise, which is limited to five years. In determining the amount to be paid there is taken into consideration: (1) The actual value of the plant and of the movable property; (2) An equitable compensation for the profits of the unexpired franchise. These profits shall be based upon the average net profits for the previous five years as declared by the private enterprise for the tax of movable riches.\*

After the amount has been fixed upon it must have the approval of the *giunta provinciale amministrativa*. In case there is a disagreement between the city and the private corporation, the matter is to be settled by three arbitrators, one being appointed by either party to the contract, and the third by the chairman of the Board of Justice.

The above conditions do not apply to existing franchises when their charters contain other clauses regarding the manner of purchase.

Lastly, in the municipalization of public service industries the bill permits the cities to borrow certain sums of money from the *Cassa dei depositi e prestiti*.†

\* A government tax somewhat analogous to the English income tax.

† A government fund which makes loans to local authorities at a moderate rate of interest, partly analogous to the fund of the English Public Works Loans Commissioners.

## ATTACK ON WARREN PAVEMENT FAILS

**Norristown, Pa., Will Lay Bituminous Macadam—Injunction Turned Down by Judge Swartz  
—The Court's Opinion**

*By Our Special Correspondent*

In a letter of recent date, Borough Engineer S. C. Corson, of Norristown, Pa., informs the MUNICIPAL JOURNAL AND ENGINEER that a contract for 25,200 square yards of Warren's bituminous waterproof macadam pavement had been ratified by the Town Council. This contract was awarded Warren Brothers early in the spring, but work upon the pavement was delayed because of an application for a preliminary injunction made by the Vulcanite Paving Company. The decision of Judge Swartz touches upon some important points which will not fail to interest our readers. The Court's opinion in refusing the preliminary injunction in part, is as follows:

"The plaintiffs pray for a preliminary injunction to restrain the Borough Council from entering into a contract with the Warren Brothers Company in pursuance with the foregoing resolution. The Court is asked to interfere first because such contract would be improvident and an intentional abuse of the power and discretion vested in the Borough Council, and secondly because the resolution as passed is not sufficient to authorize the execution of a contract involving the expenditure of nearly \$50,000. The complainants allege that there was improvidence and abuse in awarding the contract to the Warren Brothers Company without advertisement or competitive bidding. We are not aware of any act of Assembly which requires a Town Council to advertise for bids when a street improvement is contemplated. There is no borough ordinance imposing this duty. Where public work of some magnitude is to be done it is usual to solicit bids.

Competition ordinarily reduces prices. It does not follow, however, that a failure to invite competition shows improvidence. Where are improvements where competition is not feasible? The work to be done may be of a special character and the materials to be used may not be found in the open market. There can be no just complaint if the borough authorities exercised due care in the selection of the pavement and the price agreed upon for the work is reasonable.

### NOT AN INFERIOR PAVEMENT

"There is no allegation that the Bituminous Macadam pavement of the Warren Brothers is an inferior article, or that it is not suitable for the streets of Norristown.

"The Borough Council, through its engineer and Highway Committee, made investigations extending through several months to determine the kind of pavement best adapted for the streets. Those

in charge of the matter considered the various kinds of pavement. The members of the Council are familiar with the brick pavements, for they were in use upon the streets of the borough. They were found unsatisfactory for steep grades. The evidence shows that the members of the Council had some knowledge of the street asphalt in use in Philadelphia and other cities. Wood paving was found too expensive. The members who visited and examined the Warren pavement now in use made full reports to their fellow members. Town Council had sufficient information to act intelligently in the selection of the kind of pavement finally adopted. After the highway committee had considered the subject it reported to Council. The matter was discussed, and then referred back to the committee for further investigation. The committee made further inquiry, and again reported to Council. This recommendation did not materially differ from the first, except that the committee's report was more elaborate. The matter was again discussed in Council, and the proposition of the Vulcanite Company was submitted for their consideration. It was then that the resolution awarding the contract to the Warren Brothers Company was adopted. Even if we were of the opinion that Council erred in selecting the pavement manufactured and constructed by the Warren Brothers Company because in our judgment it was not the best in the market for the money, still the court should not interfere where there is no abuse of the discretion vested in the Town Council, and where this discretion was honestly exercised after due deliberation. The facts do not disclose any abuse of discretion in the selection of the Warren pavement. "It is settled beyond controversy that where the complaint is against a body that has discretionary or deliberate functions to exercise and that body has exercised the functions according to the best of its judgment the court will not interfere with that which has been done. Commonwealth vs. Mitchell, 82 Pa., 350.

### NOT SURPRISED AT THE SELECTION

"Having then the right to select the Warren pavement and having the selection in the exercise of its discretion, the question arises can the borough obtain the same pavement from other hands and for less money?

"The Warren Brothers Company owns its factory where the tar is distilled. It holds patents for the process used in constructing its pavements. Whether these patents are tenable is a matter not for



our decision; for the fact remains that no person or company so far as we have any evidence, is engaged at this time in constructing exactly the same kind of pavement. The Vulcanite Company has no factory, has not laid this kind of a pavement for ten years, and has no existing highway pavement where this kind of work may be inspected. While it offers to lay a bituminous macadam according to the Warren Brothers specifications, its expert, Mr. Richardson, declares that all such pavements heretofore laid have been taken up as failures. On the other hand, the Warren people, within the last year, have given much time and experiment to this class of pavement.

"They claim that the defects heretofore existing have been eliminated, and they offer the results of their investigation and experiments in the pavements constructed by them and now in use in various cities. These pavements were examined, investigated and tested by others as well as by members of the Town Council. The borough authorities are of the opinion that the work is durable and well calculated to meet the needs of highway travel. We are not surprised that the Council gave its preference to the Warren Brothers Company.

#### JUDGMENT OF BOROUGH COUNCIL SUSTAINED

"The Vulcanite Company offers to do the work at a saving of twenty per cent. upon the cost under the Warren Brothers' contract. How this saving is to be accomplished is not clearly shown in the proposition submitted by the Vulcanite Company. We will

assume, however, that if further opportunity had been afforded to the Vulcanite Company, a more definite proposition could have followed. Fairness to the other company demanded a specific bid by the square yard. Is the award at the higher price an abuse of discretion? Even where an Act of Assembly requires advertising and the awarding of a contract to the lowest bidder or lowest responsible bidder, the authorities may give the work to a higher bidder in the absence of evidence tending to show bad faith or corrupt motives. They may take into consideration the superior skill and experience of the bidder: *Inter-State Vitrified Brick Co. vs. Philadelphia*, 164 Pa., 477; *Reuting vs. Titusville*, 175 Pa., 512.

"Where the processes of preparing and combining the materials of a pavement differ, the results obtained are not necessarily the same. We think it is evident from the testimony before us that the pavements if laid by the two companies would not in all respects be the same. If Council has full faith in the ability of the one company to furnish what the borough wants, and lacks confidence in the other, we see no good reason why its choice should be overruled, provided its judgment was rendered after due investigation. It may make a mistake in executing the contract, but if so, it is an honest mistake of judgment so far as we have any evidence before us. The comparative merits of the pavements are matters for the Council, and not for the court. The testimony shows that the Warren pavement was selected after investigation and deliberation."

## VITRIFIED BRICK PAVEMENTS\*

**Their Use in the United States—Characteristics—Sand Cushion—Joint Fillers for Steep Grades**

*By William Pierson Judson, C. E.*

DURING the past seventeen years there has been a steadily increasing use of vitrified brick for the pavements of the streets of cities and towns in the United States, especially of those of moderate size—that is, of 100,000 inhabitants and less: the larger places welcoming brick as a competitor with sheet asphalt, and as affording another means of escape from the intolerable noise and dirt resulting from block-stone pavements and from the temporary and unsanitary features of cedar blocks, while the smaller western towns, with characteristic enterprise, have built miles of brick pavements to displace the natural mud. The total length of brick-paved streets in the United States in February, 1902, is estimated by the editor of the *MUNICIPAL JOURNAL AND ENGINEER*, at about 1,300 miles.

#### EXTENT OF ITS USE

Two to three hundred such cities and towns, as well as all of the larger cities, especially Philadelphia, have laid more or less vitrified brick pavement, and its use is constantly extending.

The excessive and peculiar roaring noise produced by the passage of light wagons over some brick pavements is objectionable on residence streets, and on some streets having heavy traffic there has been poor results as to durability. Much discredit has also been thrown upon the use of vitrified brick by the careless and ill-judged manner in which many manufacturers have sent out irregularly and imperfectly burned brick. These have been laid by incompetent contractors under inexperienced city officials, and have thus caused the needless failure of many pavements, thus stopping further extensions and preventing other cities from using brick at all, to the great gain of the sheet-asphalt companies, and with the effect of encouraging the introduction of bituminous macadam, creosote-resinate wood blocks and other high-grade pavements which are free from these defects and which have not yet had time to develop other defects which may be peculiar to themselves.

\* This article is a digest of the chapter on "Vitrified Brick Pavements," in "City Roads and Pavements Suited to Cities of Moderate Size," which we are permitted to publish by the courtesy of the author, Mr. William Pierson Judson, M. Am. Soc. Mun. Improvements, M. Am. Soc. C. E., M. Inst., C. E., Oswego, N. Y. For lack of space we are unable to include several tables of statistics and other valuable matter upon the subject. Elsewhere in this issue will be found a review of the work.—[EDITOR]

#### CHARACTERISTICS

The material for moulding any paving brick must be of a peculiar character which will not melt and flow when exposed to an intense heat for a number of days, but will gradually fuse and form vitreous combinations throughout, while still retaining its form.

The resulting brick must be a uniform block of dense texture, in which the original stratification and granulation of the clay has been wholly lost by fusion which has stopped just short of melting the clay and forming glass.

The clay while fusing must shrink equally throughout, thus causing the brick to be without any laminations or any exterior vitrified crust differing from the interior. Such a brick will be incapable of absorbing any considerable amount of water, and will hence be unaffected by frost, and if formed of the best material properly treated will be tough, to withstand the blows of horses' toe-calks; hard to resist the abrasion of wheels, and strong to carry heavy loads; these being in the order of effectiveness of the destructive forces to be met.

There is now little difficulty, with rigid inspection, of getting brick which will uniformly possess these qualities.

#### EXAMINATION OF BRICKS IN USE

The best and most useful test can, however, be made by visiting places where brick pavements have been in use for several years, and by examining the actual results of traffic upon well-known and standard makes of brick.

For instance, Columbus, Ohio, has some eighty miles of brick pavement, varying in age from one to twelve years, in which twenty-six kinds of paving bricks and blocks have been used, with various kinds of fillers in the joints. Dayton, Ohio, has some twelve miles of brick pavement, in which fourteen kinds of brick and blocks have been used.

Des Moines, Iowa, and Terre Haute, Indiana, have also large mileage, composed of great varieties of materials, as have also Toledo and Cleveland, Ohio, Louisville, Ky., and Detroit, Michigan.

A few days spent in such examination of pavements in actual use will make experiments unnecessary, and will enable the engineer who is planning new work to avoid poor bricks and to specify those kinds which can be depended upon to give good results.



LAYING PAVING BRICK ON THE SAND CUSHION IN ST. LOUIS  
Courtesy of *The Clay Worker*

This method of natural selection is gradually forcing the poor grades of brick out of the market.

#### SAND CUSHION

When ready to set the brick, the sand cushion is formed by spreading screened moist sand over the concrete or other base; this is spread uniformly to the required depth of one and one-half to two and one-half inches, and smoothed and brought to the proper crown by wooden templates, traveling on wheels or shoes and resting on the top of the curbs on either side. Upon the true surface thus formed upon the sand, the brick are set on edge, the workmen standing only upon the brick already laid, and placing the bricks in front of them in regular lines across the street; the brick in each course breaking joints with those in the next courses. The bricks are then rammed with a seventy-five pound rammer, and rolled with a two and one-half ton or a five-ton steam roller and settled firmly into the sand-bed. If the surface is then sprinkled and examined soft brick can be detected and picked out as being those which remain wet after the hard bricks have dried.

#### JOINT FILLERS

No filler has yet been found that is perfect, and there are wide differences of opinion as to the best.

Sand filler is cheap and allows the brick to be readily taken up and relaid, but it also allows the edges and corners of the bricks to chip and become rounded, and permits the bricks to settle at soft spots of subgrade.

Portland Cement Grout of equal parts of bulk, of loose cement and fine sand, if properly made and applied, is better, and there are patented mixtures which are combinations of iron-slag and cement ground together, and which are equally good or better. Grout is irregular and worthless, unless the sand used is so fine as to remain in suspension, and such sand is not easy to obtain; grout should be poured into place, but is sometimes flushed broadly over the surface and swept into joints. Grout makes it difficult to take up and relay the brick, but it can, if properly made and applied, perfectly protect their edges and corners and thus preserve a smooth surface, which is most desirable.

Paving Cement makes an elastic joint which in some cases is best, although it costs more than grout. The usual combination consists of one hundred parts by weight of No. 4 coal-tar, three parts residuum oil and twenty parts refined asphalt, kept and used at a temperature of 300° Fah., mean-

time carefully avoiding over-heating it. This hot mixture should be poured into the joints from a spout, or it may be poured upon the surface and swept in with steel wire brooms; a thin coating of sand should be at once spread over the pavement, and this will mix with the surplus pitch while still hot, so that traffic will soon grind the whole from the surface and leave the bricks clean.

#### EXPANSION JOINTS

The expansion of brick pavements during and after periods of extreme heat has been a frequent source of trouble, and many pavements have thus been heaved and broken; in some cases by a quiet raising of the brick pavement until the arch thus formed was broken by its own weight or by traffic, as occurred at Niagara Falls in July, 1897, and at Glens Falls in August, 1901; in some cases by sudden ruptures or explosions, as at Kansas City in July, 1901, where this occurred on seven streets and bricks were thrown up a foot or more. In nearly every case this peculiar result has occurred where the brick have been laid with cement joints, and where the cross-expansion has been prevented by rigid curbs; or at the apex of grades from both ways or at the top of a steep incline where the re-

sultants of longitudinal expansion have been concentrated at our place.

Expansion-joints of one inch of coal-tar, or mastic, or bitumen or sand have been formed along the curbs on both sides of the street and across the pavements from curb to curb at intervals of fifty feet; one city in Central New York took special precautions of this kind and yet has had more or less trouble every year. Other cities have taken no precautions and have no trouble. It remains to find a preventive.

#### BRICK PAVEMENT FOR STEEP GRADES

Brick pavements are often used successfully on grades which are considered to be too steep for smooth asphalt, which may afford no foothold, or for macadam, which may be gullied by heavy rainfalls. It is often difficult to decide what pavement to use in such cases and equally difficult to select from the various forms of vitrified bricks and the different ways of laying them in order to secure the best results on steep grades.

The following table is given of the steepest grades of brick pavements, in actual use in 1900, in the cities named; the fact that such steep grades are in use, may not be taken as a reason for imitation, but may furnish conclusive reasons for avoidance.



PUTTING DOWN THE CONCRETE FOUNDATION FOR A BRICK STREET IN ST. LOUIS  
Courtesy of *The Clay Worker*



## MAXIMUM GRADES OF BRICK PAVEMENTS, 1900

Grade in feet per 100 feet.	Grade in feet per 100 feet.
Albany, N. Y. .... 9.3	Nashville, Tenn. .... 7
Baltimore, Md. .... 15	Parkersburg, W. Va. .... 15
Columbus, Ohio .... 9	Peoria, Ill. .... 8.4
Des Moines, Iowa .... 11	Philadelphia, Penn. .... 6
Erie, Penn. .... 7	St. Joseph, Mo. .... 10
Joliet, Ill. .... 6	Toledo, Ohio .... 5.6
Mansfield, Ohio .... 8	Troy, N. Y. .... 7
Milwaukee, Wis. .... 8	Wheeling, W. Va. .... 8

Cost. The average cost of construction of brick pavement on concrete complete in 1894, not including curbing and extras, as shown by the table on page 84 was \$2.21 per square yard, varying from \$1.56 at Allegheny, Pa., to \$3.00 at Providence, R. I.

On April 10, 1900, at Chillicothe, Ohio, offers were made by six bidders for pavement to be formed of either of seven different kinds of first-class paving bricks, using either of four different kinds of filler in the joints and naming a price for each; six inches of concrete forming the foundation in each case. For the concrete base

the prices ranged from twenty-eight to thirty-four cents, with an average of thirty-one cents per square yard.

For the bricks laid in place, the prices ranged from seventy-seven to eighty-eight cents with an average of eighty-four cents per square yard.

For the fillers, the prices per square yard ranged from an average of nine cents for cement to an average of sixteen cents for "No. 6 filler;" fifteen cents was bid and accepted for "Murphy grout," a patented mixture of powdered iron-slag and cement, which was used.

For the complete pavement (not including excavation or curbs) the prices ranged from \$1.24 to \$1.38 with an average of \$1.33 per square yard.

On May 18, 1900, at Kewanee, Illinois, four bids were made for vitrified brick pavement on six inches of concrete for which the price for base, pavement and filler complete in place, ranged from \$1.42 to \$1.47, with an average of \$1.45 per square yard.

These and other prices are given in the table on page 100, in each case giving not only the minimum price at which the work was done in each case, but also the highest bid and the mean of all the bids, for use in preparing estimates of cost for similar work.

## GAS RATES IN THE UNITED STATES

## More Than Half of Total Production Used by Five Cities—Lower Rates in Large Cities—Fifteen Municipal Plants

By Alton D. Adams \*

FIVE great cities, New York, Chicago, Philadelphia, Boston and St. Louis, consumed 56 per cent. of all illuminating gas sold in the United States by private plants during 1900. In the same year 862 private plants sold 66,608,601,350 cubic feet of gas at an average price of \$1.035 per 1,000 feet. In the five largest cities 28 plants sold 37,722,047,505 cubic feet of gas during the same period at the average price of \$0.880 per 1,000 feet. Outside of these five cities 834 private plants sold 28,886,553,845 cubic feet of gas at an average of \$1.239 per 1,000 feet, or 40 per cent. greater. This difference in price is largely due to the fact that up to a certain point the cost of manufacture for gas decreases with the capacity and rate of output of the works.

New York City leads in the consumption of gas with 18,180,821,125 cubic feet at an average price of \$0.905 per 1,000 feet. Chicago consumes less than one-half as much gas as New York City, but gets it at an average of \$0.871 per 1,000 feet, while Philadelphia using only 38 per cent. as much gas as New York City escapes with an average charge of \$0.761 per 1,000 feet. Boston consumes 50 per cent. more gas than St. Louis, but the average price at Boston is \$1.034 per 1,000 feet against \$0.930 in the latter city. Of the five cities, Philadelphia pays the lowest and Boston the highest average price.

## PRICES LOWER IN LARGE CITIES

The fact that prices are much lower in large cities is clearly brought out by a comparison of rates in the cities just named with the rates outside of these cities in their respective States. In the State of New York outside of the city the average price was \$1.327 per 1,000 feet.

## GAS SOLD IN GREAT CITIES AND IN EACH STATE OUTSIDE OF THESE CITIES

Location of plants.	No. of plants.	Cubic feet of gas sold.	Average price per 1,000 feet.
New York City.....	13	18,180,821,125	\$0.905
Chicago .....	4	8,367,801,185	0.871
Philadelphia .....	3	7,055,559,210	0.761
Boston .....	6	2,510,635,235	1.034
St. Louis .....	2	1,607,230,800	0.930
	28	37,722,047,505	0.880

## FIVE STATES OUTSIDE THE FIVE GREAT CITIES

New York .....	98	2,560,725,374	\$1.327
Illinois .....	49	1,024,270,066	1.163
Pennsylvania .....	86	1,734,740,381	1.120
Massachusetts .....	59	2,136,264,551	1.274
Missouri .....	22	994,387,775	1.031
Five States .....	314	8,450,388,147	1.216

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The average price outside in the State was thus 46 per cent. above that in Greater New York. For the five States outside of the five cities named the average price was \$1.216 per 1,000 feet, or 38 per cent. more than the average of \$0.88 for the cities. The entire production of gas in the five cities was yielded by 28 plants, while 314 plants were used to develop less than one-fourth this production in their States.

## AMOUNT USED IN DIFFERENT STATES

In forty-seven states and territories including the District of Columbia gas was distributed by 862 private plants. In the following table the states are arranged in an order corresponding to the total volume of gas produced in each.

## GAS SOLD BY PRIVATE PLANTS IN 1900

State where located.	No. of plants.	Cubic feet of gas sold.	Average price per 1,000 feet.	Profit per 1,000 feet.
New York .....	101	20,741,546,599	\$0.957	\$0.229
Illinois .....	53	9,392,071,196	0.903	0.484
Pennsylvania .....	89	8,790,299,591	0.832	0.161
Massachusetts .....	65	4,646,899,791	1.144	0.370
Ohio .....	71	3,365,662,200	0.954	0.407
New Jersey .....	34	2,743,758,799	1.210	0.229
Missouri .....	24	2,601,618,576	0.968	0.486
Maryland .....	11	1,414,721,120	1.252	0.573
Wisconsin .....	25	1,192,222,406	1.008	0.343
Michigan .....	37	1,125,252,089	1.008	0.166
California .....	41	1,079,078,130	1.718	0.535
District of Columbia.....	3	1,075,210,187	1.109	0.445
Connecticut .....	21	1,047,838,014	1.205	0.296
Rhode Island .....	6	765,556,052	1.150	0.257
Indiana .....	39	764,135,883	1.145	0.390
Minnesota .....	10	727,541,693	1.303	0.501
Iowa .....	26	477,328,202	1.361	0.110
Kentucky .....	16	434,637,240	1.294	0.393
Georgia .....	12	401,946,712	1.235	0.256
Colorado .....	5	346,248,400	1.269	0.568
Tennessee .....	11	344,411,892	1.383	0.569
Nebraska .....	8	329,574,194	1.453	0.302
New Hampshire .....	13	212,670,047	1.413	0.128
Louisiana .....	3	204,503,400	2.096	0.914
Virginia .....	8	175,836,500	1.218	0.161
Kansas .....	17	173,812,220	1.672	0.586
Texas .....	11	172,088,580	1.845	0.713
Maine .....	9	165,054,440	1.496	0.454
Delaware .....	4	161,344,226	0.920	0.331
Washington .....	6	138,270,703	1.856	0.462
Alabama .....	11	122,635,152	1.622	0.490
South Carolina .....	4	99,383,400	1.537	0.420
Florida .....	11	78,022,877	1.977	0.937
Oregon .....	5	67,658,000	2.224	0.878
Arkansas .....	7	66,543,948	1.941	0.532
North Carolina .....	10	46,451,300	2.389	0.225
West Virginia .....	7	39,402,580	1.291	0.014
Mississippi .....	5	36,716,805	2.017	0.521
Vermont .....	7	35,886,400	1.818	0.488
Utah .....	2	31,000,000	1.162	....
Montana .....	2	26,070,000	2.287	....

North Dakota .....	2	26,000,000	2.031	....
South Dakota .....	2	19,508,005	1.837	....
Arizona .....	3	7,080,000	2.412	0.071
Wyoming .....	1	5,565,400	1.725	....
Nevada .....	3	4,873,900	4.500	0.964
New Mexico .....	1	4,665,000	2.402	....
United States .....	862	66,608,601,350	1.035	....
Five great cities .....	28	37,722,047,505	0.880	....
Outside of five great cities .....	834	28,886,553,845	1.239	....

## PRICE NOT REGULATED BY VOLUME

Average prices for these states and territories range from \$0.832 per 1,000 feet in the entire State of Pennsylvania, where 8,790,299,591 cubic feet of gas were sold, to \$4.90 per 1,000 feet in Nevada with a consumption of only 4,873,900 feet. Unfortunately, however, differences between the average prices of the several States cannot be explained merely on the basis of the volumes of gas sold. Thus, 2.3 times as much gas was sold in the State of New York as in Pennsylvania, but the average price was lower in the latter State by 12.5 cents per 1,000 feet. Neither can such differences in prices be accounted for by reference to the prices of coal.

Much the greater part of the gas now sold, especially in the States with great cities, is produced by the water-gas process. Speaking roughly, each 1 dollar in the cost of coal per ton adds 3 cents per 1,000 feet to the cost of water gas. Nearly all of the illuminating gas made in New York and Pennsylvania is water gas. Certainly the price of coal in New York is not four dollars higher than it is in Pennsylvania. Moreover, the average volume of gas sold, per plant, was nearly twice as great in New York as it was in Pennsylvania.

Massachusetts made a third more gas than Ohio, and in a smaller number of plants; but the average price of gas was 19 cents higher per 1,000 feet in the former than in the latter State. In Michigan and Wisconsin the average price of gas was 24.4 cents less than the amount charged per 1,000 feet in Maryland, though the latter State makes more gas in larger plants than either of the former, and is certainly as well located in reference to the coal fields.

## INTERESTING CONTRASTS

Three large plants in Louisiana make about the same amount of gas as thirteen smaller plants in New Hampshire, yet the average price of gas in the Southern is 68.3 cents higher than the like average in the Northern State, per 1,000 feet. Nearly equal volumes of gas were sold in Maine and Delaware, but the good people of Maine paid 57.6 cents more per 1,000 feet for their gas than did those of Delaware. In West Virginia the average price of gas was \$1.291 per 1,000 feet, but in North Carolina, where about one-fifth more gas was sold, the price was \$2.389. Two plants in Utah got \$1.162 for gas per 1,000 feet, and two plants in Montana of a little less output charged almost double this figure, or \$2.287. Gas sold for \$1.725 per 1,000 feet in Wyoming, but the price was \$4.50 per 1,000 in the nearby State of Nevada. Even for coal gas, the increase in cost of manufacture is only about 10 cents per 1,000 feet for each dollar per ton added to the price of coal.

While great differences in the price of gas exist between States where the annual productions are nearly equal, nearly the same prices may be found in States where the yearly volumes of sales are far apart. Thus, New York paid a higher average rate for its 20 billion feet of gas than Delaware was charged for less than one one-hundredth of this amount. Evidently the much heralded advantages of production on a large scale have not been fully realized in New York. So again, the people of Massachusetts bought more than 4½ billion feet of gas at very nearly the same price per 1,000 feet that was paid in far away Utah for the one hundred and fiftieth part of this total volume.

In West Virginia, a coal producing State, 39 million feet of gas were sold at an average price of \$1.29 per 1,000 feet, and in Maryland, an adjoining and also a coal producing State, a price of \$1.25 per 1,000 was paid for 362 times the volume of gas sold in the former State. Private plants in New Jersey made 151 times as much gas as those in Virginia, but the prices per 1,000 feet in the two States were equal to within the fraction of a cent. The volume of gas sold in California was 196 times that sold in Wyoming, but the prices in the two cases were less than 1 cent apart. In every one of the instances just cited the average production per plant was much the greater in the State where the larger volume of gas was sold.

## GAS SOLD BY MUNICIPAL PLANTS IN 1900

State where located.	No. of plants.	Cubic feet of gas sold.	Average price per 1,000 feet
Virginia .....	4	230,376,160	\$0.97
West Virginia .....	1	107,577,850	0.70
Ohio .....	2	74,635,620	0.70
Massachusetts .....	3	26,543,000	1.46
Minnesota .....	1	25,310,000	1.22
Kentucky .....	1	12,715,100	0.99
Missouri .....	1	4,126,000	1.55
Michigan .....	1	1,843,390	3.14
Nebraska .....	1	1,825,000	2.00
United States .....	15	484,952,120	0.92

## CONTRAST BETWEEN PRIVATE AND MUNICIPAL PLANTS

In contrast with the 862 private plants engaged in the manufacture and sale of gas during the census year, there were only 15 municipal plants. These plants operated by cities and towns sold 484,952,120 cubic feet of gas during the year, or about seven-tenths of 1 per cent. of the volume sold by the private plants. For each of the 862 private plants the average amount of gas sold was 77 million cubic feet, but for each of the 15 municipal plants the like average was only 32 million feet. In view of the superior efficiency claimed for production on a large scale, it might be thought that the average price of gas sold by the private would be less than that sold by the municipal plants, yet such was not the case. The private plants sold more than 66 billion feet of gas at an average of \$1.035 per 1,000 feet during the year. Meantime the municipal plants sold less than one-half of a billion feet at the rate of only 92 cents per 1,000. In spite of the small product of the municipal plants, their average price was thus 11 cents lower per 1,000 feet than the charge made by the private corporations.

The fifteen municipal plants are located in nine States, and it is instructive to compare their rates in these states with the rates charged by private plants there and elsewhere. The four municipal plants in Virginia sold 230,376,160 cubic feet of gas, or nearly one-half of the total sales by such plants in all the states. For this gas the average price in Virginia was 97 cents per 1,000 feet, while private plants in the same State sold 175,836,500 feet at \$1.218 per 1,000. In West Virginia the single municipal plant sold 107 million feet of gas at an average price of 70 cents per 1,000, and seven private plants there got \$1.291 per 1,000 for 39 million feet. Two municipal plants in Ohio sold 74 million feet of gas at 70 cents per 1,000 feet, while 71 private plants in the same State got 95.4 cents per 1,000 for 3,365 million feet, or 45 times the volume sold by the municipal plants. In Ohio, the average production was 37 million feet of gas per municipal and 47 million feet per private plant, so that the private plants had the advantage as to output per plant.

## MASSACHUSETTS PLANTS

Three small plants operated by towns in Massachusetts sold 26 million feet of gas valued at \$1.46 per 1,000, while 59 private plants outside of Boston sold 2,136 million feet at \$1.274 per 1,000 feet. As the average production of each private plant was more than 36 million feet, while the average for the town plants was less than 9 million feet, the higher price in the latter is easily explained. A single municipal plant in Minnesota sold 25 million feet of gas at the rate of \$1.22 per 1,000, and ten private plants got \$1.303 per 1,000 for 727 million feet. In this case the average production of gas was three times as great per private as per public plant, but the former got the higher price.

Sixteen private plants in Kentucky, with an average production of 27 million feet of gas each, charged at the average rate of \$1.29 per 1,000, while the one municipal plant there sold 12 million feet at 99 cents per 1,000. In the three remaining states with municipal plants, the volume of gas sold by each ranged from 1 to 4 million feet, amounts so slight that the average prices of private plants were necessarily the lower. Virginia, West Virginia and Ohio are the only states where the average capacity of municipal gas plants is sufficient to warrant an expectation of low cost production. Excluding the five great cities previously named, the average prices of gas in the municipal plants of Virginia, West Virginia and Ohio respectively are lower than the prices charged for private plants in any state of the Union except Delaware. In West Virginia and Ohio the common price of 70 cents per 1,000 feet for gas from municipal plants is lower than the price made by private plants in any State or in either of the five great cities. Nevertheless, the output of the largest of these municipal



plants, 107 million feet, was far smaller than the average output of 1,398 million feet at New York, 2,091 million feet at Chicago, 2,351 million feet at Philadelphia, 418 million feet at Boston, or 803 million feet at St. Louis, for each private plant.

#### RELATION OF VOLUME TO COST

In those States where the annual sales of gas are greatest and the average size of plant the largest, it is natural to expect that the profit of manufacture per 1,000 feet of gas will be least, because the necessary investment per unit of capacity decreases as the size of plant goes up. By profit of manufacture is here meant the excess of income over operating expenses, no allowance being made for depreciation, interest or dividends. These three charges must of course be met out of the profits of manufacture. In the table the average profit of manufacture per 1,000 feet of gas sold is given for all the private plants in each state.

No attempt is here made to determine just how much the profit on manufacture should be to cover depreciation, interest and dividends. Looking at states where the volumes of gas sold were nearly equal, great differences appear in the profit per 1,000 feet. In Pennsylvania the gas companies managed to exist on an average profit of 16.1 cents per thousand feet, but in Illinois, where the volume of gas sold was

somewhat greater, every 1,000 feet put a profit of 48.4 cents into the tills of the gas companies. The production of gas in Maryland was a little greater than that in Michigan, but each 1,000 feet in the former State brought a profit of 57.3 cents, compared with only 16.6 cents in the latter. Nearly equal volumes of gas were sold in New Hampshire and in Louisiana, yielding a profit of 12.8 cents per 1,000 feet in the former and 91.4 per 1,000 in the latter State. In Virginia and Texas the sales of gas were nearly equal in amount, but in Texas the profit was 71.3 cents per 1,000 feet, while the Virginia plants obtained a corresponding profit of only 16.1 cents.

In some of the states where the largest sales of gas were made the profits per 1,000 feet were quite as great as those in states where the amount of business was much smaller. Gas sales in Massachusetts reached 29 times their volume in Delaware, but the average profit per 1,000 feet was 3.9 higher in the former than in the latter State. California was the market for ten times as much gas as South Carolina, and the profit was 11.5 higher per 1,000 feet in the former State.

In every one of the instances above cited the state where the larger rate of profit was made, or where the volume of gas sold was greater, or both, was also the field where the higher price was charged for gas. The facts here presented are derived, largely by calculation, from the reports of the twelfth census of the United States.

## 'FRISCO WIRES GO UNDERGROUND

**728 Miles of Wire Removed—15,000 Miles of Conductor Laid—Work to Move Steadily On—Hard to Get Supplies**

*By William R. Hewitt\**

THE following table will show what progress has been made in the work of burying San Francisco's electric wires since the passage of the ordinance:

Total amount of overhead wire removed.....	728.8 miles
Total number of poles removed.....	421 miles
Total amount of cable laid.....	116 miles
Total amount of conductor laid.....	15,000 miles

In order to clear the streets of overhead wires in the downtown districts, the Board of Supervisors passed Ordinance No. 214, August 14th, 1899, which provides that the city be divided into four underground districts.

The first district, in which the time limit was to expire February, 1900, included that part of the city east of Montgomery and New Montgomery streets, from Washington to Howard and the bay.

The second included that section of the city between Stockton, Fourth and Kearny on the west, Montgomery and New Montgomery on the east, New Montgomery and Bush on the north and Howard on the south, in which the time was to expire January 1st, 1901.

The third, in which the limit was July 1st, 1901, included that section of the city between Taylor and Sixth on the west, Sutter on the north, Howard on the south and Stockton and Fourth on the east.

#### ONLY MESSENGER WIRES EXCEPTED

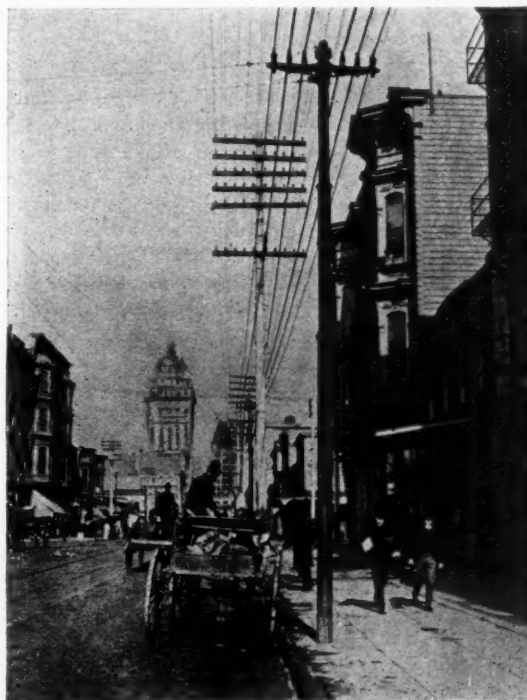
The Fourth included all the district between Franklin and Fulton on the west and bounded by the general lines of the fire limits up Larkin and out Polk street as far as Clay, with an eastern boundary on Powell street. In this district the time was to expire July 1st, 1902. This also included Mission street to the ferries and Third street as far south as Townsend.

At the solicitation of the messenger companies, provision was made for the retention of messenger service wires overhead to cross streets at a common point.

Previous to the passing of this ordinance, in response to a communication to the Board of Supervisors requesting an annual appro-

priation for underground work, the Department of Electricity was granted an appropriation of \$20,000, and preliminary work was begun for underground construction, which included the designing of an entirely new system, with an equipment of conduits, manholes, cables, standards, box standards and boxes. The city was laid out in four underground districts, the first of which included all that section east of Third and south of Market to the bay.

Twenty thousand feet of 2½-inch steel conduit was laid and 45 manholes were constructed, which work was practically completed by June 30th, 1899.



THE OVERHEAD WIRE NUISANCE

\* Chief of the department of electricity, San Francisco, Cal., who wrote this article for a recent number of the *Merchants' Association Review* of that city, by whose courtesy we are permitted to republish it in full, with the illustrations.—[EDITOR.]

## APPROPRIATIONS WERE LACKING

No appropriation was made for the fiscal year 1899-1900 for the Department of Electricity, nor for the fiscal year 1900-1.

For the fiscal year 1901-2 an appropriation was made which enabled this department to lay 25,000 feet of conduit and construct 55 man-holes.

In No. 2 underground district, which included that section of the city east of Stockton, north of Market and south of Broadway to the bay, this work was practically completed by the 1st of March.



THE AFTER EFFECT—WIRES UNDERGROUND

Work was immediately begun by drawing in cable into underground district No. 1, which district is practically completed.

Work is about to be commenced in district No. 2, the cable for which is purchased and on hand. The work will be completed by June 30th of the present year.

## TIME LIMIT HAD TO BE EXTENDED

Since no appropriation was made for this department for underground work as heretofore mentioned, an ordinance was passed in February, 1900, by which the expiration of the time limit was extended for the several underground districts until such time as this department should remove its wires; and, as this department was

practically without poles of its own in the down-town districts, it followed that the companies were unable to remove their poles and wires, although prepared to do so.

The work of removing overhead wires proved to be a much larger undertaking than was supposed at the time of passing the ordinance, although the companies at that time consulted with the Merchants' Association and practically agreed to the time limits as set in the ordinance. Still they find themselves unable to remove their wires as rapidly as they could wish, although working constantly with a reasonable amount of diligence.

The San Francisco Gas and Electric Co. has removed all of its poles and wires in underground district No. 1, with the exception of those still occupied by the city, and is rapidly proceeding with the work of removal in the other districts.

## WORK OF THE COMPANIES

The Mutual Electric Light Co. has removed all overhead construction from districts Nos. 1 and 2, and is proceeding to remove its overhead construction in district No. 3 and district No. 4, which work is steadily progressing.

The Pacific States Telephone and Telegraph Co., which has had by far the greatest amount of work to do, has removed practically all of its overhead construction in districts No. 1, and 2, with the exception of those poles still carrying municipal wires, and work is steadily progressing in the other districts.

The Western Union Telegraph Co. has removed its wires from all of the districts, putting everything underground within those districts, and has no overhead construction standing, save that occupied by the municipal service.

The Postal Telegraph Co. is proceeding rapidly to remove its wires and change its construction to an underground service, and will clear all of the districts in about four months.

In addition to the underground construction, maps were draughted of all the buildings in underground districts 1 and 2, having in view the fixing of common points of crossing for the district messenger service. The consent of the property owners to the construction and erection of standards has been obtained from a majority, and there remains to be done the placing of the standards and the stringing of the cables, which has been deterred because of the street construction still standing.

## HARD TO GET SUPPLIES

Great difficulty has been experienced by the several different companies in obtaining underground conduit and cables, owing to a rush of orders in the Eastern factories. Orders have been carried forward for a great length of time, so that it has been impossible to work as rapidly as could be desired.

The conduit generally used has been steel pipe, terra cotta, fibre and redwood.

The work is proceeding as rapidly as possible and it is only a matter of the necessary time when there will be no more overhead wires in the down-town streets.



PANORAMIC VIEW OF THE CITY OF THE GOLDEN GATE



# STANDARD PORTLAND CEMENTS

## Proportions—Fineness of Cement—Specific Gravity—Blowing Test—Time of Setting—Tensile and Compressive Tests

All experiments shall be carried on, as nearly as possible, at a uniform temperature of 65 deg. Fah., except when tests are being made for the purpose of ascertaining the comparative strength of cements required for winter use.

### PROPORTIONS

All proportions shall be determined by weight.

### FINENESS OF CEMENT

For the present, a maximum residue of 10 per cent. on the 100 x 100 mesh sieve shall be the test for fineness, and the whole of the cement shall pass a 50 x 50 mesh sieve. The gauge (Stubb's) of the wire shall be No. 35 for the 50 x 50 sieve, and No. 40 for the 100 x 100 sieve. A mechanical sifter, working automatically by jig motion, and thus eliminating personal error, is recommended.

In the case both of hand mixing and sifting with the mechanical mixer, the process shall occupy a definite time, depending upon the weight to be sifted, and the diameter of the sieve. For example, with a weight of 10-oz. of cement, and sieves 8-in. in diameter, the sifting shall be continued 2½ minutes on No. 120 sieve, 1 minute on No. 100, ¾ minute on No. 60 and ½ minute on No. 50.

The introduction of small weights, such as washers, into the cement, while being sifted, is to be deprecated, as they tend to push an undue proportion of the cement through the mesh, to stretch the wires and to increase to some extent the grinding. Such practice should not be allowed, excepting on works of construction, where there may be a necessity for ordinary rough tests.

The sieves shall be periodically examined with great care, as moisture sometimes collects on the wire, so that when a residue test is made this moisture mixes with the cement, causing a coating on the wires, and often appreciably diminishes the area of the mesh.

The sand for standard tests shall be quartz, crushed so that the whole can pass through a 20 x 20 mesh sieve (wire No. 28 Stubb's gauge), but sufficiently coarse to allow of the whole being retained by a 30 x 30 mesh sieve (wire No. 21 Stubb's gauge).

### SPECIFIC GRAVITY

The specific gravity is for the purpose of determining the degree of calcination of a cement with certainty, and is therefore of great importance. The specific gravity of a Portland cement shall be at least 3.09, and shall not exceed 3.25 for fresh cements, the term "fresh" being understood to apply to such cements as are not more than two months old. The gravimetric system is recommended for the determination of the specific gravity.

Portland cement improves with age, provided it is properly stored and kept in air-tight bags or barrels. Specifications, therefore, should not prescribe only fresh cement.

The following description of the method of carrying out this test is taken from a paper on "Testing of Portland Cement," by Gary, Tran. Amer. Soc. of Civil Engineers, October, 1893.

"The determination of the specific gravity of the cement particles by the volume-meter of Schumann, is a well-known uniform method. This consists of a glass bottle of about 200 cu. cm. (12.2 cu. in.) capacity, with a calibrated glass tube in its neck. The bottle is nearly filled with oil of turpentine, the tube tightly inserted and filled by a pipette with the same oil to the zero mark of the scale, care being taken that all air bubbles are removed. One hundred gr. (3.5 oz.) of cement is put in through the tube, which is then closed by a cork. When the fluid becomes clear, the height of its top surface is noted on the scale. The weight of the cement divided by its volume, as determined by the scale of readings, gives the specific gravity. To secure precise results, it is necessary that the temperature should remain uniform throughout the experiment, and hence vessels, cement and oil must have been kept in the same room for some considerable time. In hot weather the apparatus can be put into water of a known constant temperature. If 100 gr. of cement

are used, a rise of 1° Cent., between the two readings decreases the specific gravity 0.8 per cent."

### BLOWING TEST

The hot bath test for detecting the presence of free lime, etc., shall be carried out in the following manner: Mortar pats, prepared of neat cement and thoroughly worked, shall be troweled upon ground glass plates (carefully cleaned, preferably with acid) about 5 inches long by 2½ inches wide, and ¼-inch thick, so as to exclude all air and moisture.

The pats shall be about ½-inch thick in the centre, and shall be worked off to sharp edges on the four sides of the plate. They shall then be covered with a damp cloth and allowed to remain in the air until set, after which they shall be placed in vapor in the Faija bath tank, in which the water is to be heated to a temperature of about 130 deg. Fah. After remaining in the vapor for 6 hours, including the time taken to set in air, they are to be immersed in hot water, and allowed to remain there for 18 hours. Upon their removal from the bath, the samples should not be curled up, should not have fine hair cracks nor be distorted, and should not have large expansion cracks. The samples, if separated from the glass, should break with a sharp, crisp ring. If these conditions are satisfactorily fulfilled, it is believed that no free lime is present in a form that will prove detrimental. Cements when very finely ground, even if slightly overlimed, are not so liable to blow.

### TIME OF SETTING

The time of setting shall be determined by noting the time required for a sample under test to bear a needle of 1/12 inch diameter loaded with one-fourth of a pound, and 1/24 of an inch diameter loaded with one pound, the mortar under test being of the consistency of rather stiff plaster or mortar. The percentage of water used shall be stated in the report.

### TENSILE AND COMPRESSIVE TESTS

The strength of Portland cements shall be determined by testing a mixture of cement and quartz sand. The tests shall be made in a uniform manner (both for tension and compression) with briquettes of the same form and same cross section and with the same apparatus.

Neat Cement.—Neat tests, except where fineness, specific gravity and hot bath blowing tests are also made, are misleading as to the value of a cement. Briquettes of neat cement, in which these characteristics have been determined and found to be satisfactory, shall bear a tensile stress of 250 lbs. per square inch at the end of three days; 400 lbs. square inch at the end of seven days, and 500 lbs. per square inch at the end of 28 days. All briquettes shall be one day in air, under a damp cloth or in a damp chamber, and submerged in clean water for the remainder of the time periods. Any cement which shows a decrease in strength on or before the twenty-eighth day is to be rejected. The decisive tests shall be considered as the average of five briquettes, although for ordinary practice, two or more briquettes may be sufficient and, in the latter case, only the highest test of the group is to be taken as the strength of the cement.

In determining the tensile strength of a briquette, the area of the broken surface shall be measured with great accuracy, as errors sometimes exceeding 10 per cent. are possible unless such measurements are insisted upon.

Sand and Cement.—In sand tests the sand and cement must be thoroughly mixed together while dry. After the water has been added either for neat or sand tests the mortar shall be thoroughly mixed for a uniform time; suitable periods being two minutes for machine mixing and five minutes for hand mixing.

Briquettes made of one part cement and three parts standard sand,

in the manner described hereafter, shall stand 125 lbs. per square inch at the end of seven days, and 200 lbs. at the end of twenty-eight days.

At the end of the same period the minimum compressive strength of a mixture of one part cement to three parts sand, shall be 2,000 lbs. per square inch.

[Note.—Quick setting cements generally show a lower strength than that specified above].

The tensile strength of briquettes mixed in the proportion of 3 to 1, or of other sand briquettes, shall not show a decrease either on the twenty-eighth day or subsequently.

In every case the quantity of water used in mixing shall be stated in the report.

The quantity of water used in neat tests varies with the kind of cement, fineness, etc., and hence no arbitrary quantity can be specified, the correct method being to bring all mortars to the same degree of plasticity. An apparatus, similar to "Vicats," and consisting of a needle having an area of 0.4 square inches weighted to about 11 oz., may be used.

"The tests are made as follows: A ring, 1½ in. in height and 3-in. in diameter, made of non-absorbing material, is placed on a glass plate and filled with the mortar to be tested, the consistency being such that the needle does not entirely pierce it." (Trans. Amer. Soc. Civil Engineers, Oct., 1893.)

#### PREPARATION OF BRIQUETTES HAND-MADE

(1) Neat Cement.—The moulds shall be slightly oiled on the inner side and placed upon a metal or glass plate. The mixture of cement and water shall then be thoroughly worked together (preferably in a Fajja's mixer) for five minutes. The moulds shall then be filled well above the rim so that the mortar presents a convex surface. With an iron trowel the mixture shall then be patted, commencing at the side, first gently and then harder until it becomes elastic and water appears upon its surface. No after addition of the mixture shall be allowed, as the briquettes must be of uniform density throughout. The superfluous cement shall then be removed and the surface smoothed by means of a knife or sharp-edged trowel. The moulds can only be removed when the cement has hardened sufficiently. The briquettes shall then be placed in a damp chamber (zinc lined) furnished with a lid (also zinc lined), to prevent the irregular drying of the briquettes under varying degrees of temperature. After a period of twenty-four hours the briquettes shall be laid in water and kept completely submerged during the whole period of hardening.

(2) Sand and Cement.—Five pieces of blotting paper soaked in water shall be laid upon a metal or glass plate, and upon each piece of paper there shall be placed a mould, also moistened with water. The cement and sand in their specified proportions shall then be thoroughly mixed together, after which the water shall be added, and the whole thoroughly worked for five minutes. With the mortar thus obtained each mould shall be filled by one application so as to rise in a convex form above the edge of the mould. With an iron trowel the mortar shall then be patted, beginning from the side, first gently, then harder, until it becomes elastic and water appears upon the surface. No additional material must be added, as the briquettes must show a uniform density throughout. Superfluous mortar shall then be taken off by means of a knife or sharp-edged trowel, and the surface smoothed.

The moulds shall then be carefully removed and the briquettes laid in a damp chamber (zinc lined) furnished with a lid (also zinc lined), to prevent irregular drying. After a period of 24 hours the briquettes shall be laid in water and shall be kept completely submerged during the whole period of hardening.

#### MACHINE-MADE

(1) If possible, briquettes prepared as above shall be subjected to a uniform specified pressure (say, for example, 20 lbs. per square inch) by means of a ram of the same gauge as the moulds or

(2) A Böhme apparatus may be used. In this case, the moulds shall be filled with about 4/10ths of a lb. of mortar, prepared as in (a) and shall be placed in the machine; 150 strokes shall then be applied to the core with a hammer of about 4.4 lbs. in weight (2 kilog.) After removing the mould and the core the briquettes shall be smoothed off, taken off the subjacent plate and treated as in (a).

#### TESTING MACHINES

Testing machines shall be of the positive lever automatic type, so arranged as to apply the loads quietly and uniformly at the rate of 200 lbs. per minute.

#### CLIPS

The style of clips shall be such as will break the briquette at the line of least section. Clips with adjustable rubber or paper composition rollers are found to work satisfactorily and should be used.

#### CHEMICAL TESTS

Chemical tests and full quantitative analyses are strongly recommended, and preference will be given to cements of which analyses are furnished by the manufacturers.

#### ADULTERATIONS, ETC.

Any cement containing adulteration shall not be accepted as a Portland cement. There are also certain ingredients which should be strictly limited in their amount. If there is found to be more than 2 per cent. of sulphuric acid or 3 per cent. of magnesia, the cement should be rejected. It is understood that Portland cements only are being specified for. The Silica or sand cements are in a class by themselves, need special specifications, and are not intended to be included in the present one.

#### PACKING

Cement shall either be packed in paper-lined air-tight barrels, well constructed and hooped so that, under ordinary conditions of handling, no cement shall sift out, or if in sacks, the texture of the sacks shall be so strong and fine as not to permit of any sifting out or wasting of cement under ordinary conditions of handling. The net amount of cement, deducting the weight of the package, shall be 350 lbs. per barrel.

#### CERTIFICATE

The manufacturer shall give a written certificate with each shipment of cement, stating (1) the date of manufacture; (2) the tests and analyses which have been obtained at the manufacturer's laboratory for cement taken from the day's grinding of which this shipment forms a part; (3) that the cement does not contain any adulteration.

#### RECOMMENDATIONS

Frost Test on Cement.—In case of experimental tests made for the purpose of determining the action of cements when exposed to severe frost, it is recommended that the cements be mixed at a temperature below freezing, with cold water, cold sand, and kept exposed to ordinary winter weather, just as they would be exposed in actual construction of masonry. A description of what is done in this connection should be kept for comparison with other results, and the records of such experiments filed with the secretary of the Canadian Society of Civil Engineers.

It has been observed in hot bath tests, that little postules or eruptions take place on the surface; instances are also given of the glass shattering in the hot bath test without separating from the cement or without any other sign of failure on the part of the cement. Members of the society are requested to observe the causes or reasons therefore and report the same to the secretary of the society.

Inasmuch as small consumers are rarely able to gauge or mix their test specimens with a mechanical mixer, it is advised that where tests are made by hand mixing, due discrimination shall be made in comparing the results with tests made by mechanical mixing. Hand mixing done by an expert will probably agree closely with mechanical mixing, but for ordinary testing the mechanical method will give more uniform results, inasmuch as no skill or dexterity is required to produce approximate uniformity.

Cement testers, where possible, should make long time tests to see whether or not there is any connection between high early tests and future falling off in tensile strength, and whether, when mixed three to one in sand, the same or similar deterioration is observed. These tests should, if possible, be carried on for several years. It would be of the utmost value to the profession to obtain positive data on this point from engineers in charge of municipal, university or other laboratories, who are in a position to supply it.—*The Canadian Engineer*.



# ONEIDA COUNTY GOOD ROADS

**Many Difficulties Encountered and Overcome—The State Aid Plan Popular—Money Road Tax System More Appreciated**

*By W. Pierrepont White\**

THE Oneida County League for Good Roads was organized at Utica, N. Y., in 1893, with Colonel William Carey Sanger, now Assistant Secretary of War, as president; Thomas R. Proctor as vice-president, and W. Pierrepont White as secretary, and has continued with these same officers to this date. It is chiefly through the efforts of this League that the road agitation in New York State has been brought away from the point of view of the men interested in the coach and four, the bicycle and the automobile, to the point of view of the farmer and the question of transportation of farm products.

## DIFFICULTIES ENCOUNTERED

When the League was organized the local papers would print nothing in regard to road agitation, except as a courtesy to the officers of the League, and required then to send signed communications in order to relieve the paper of having to vouch for ideas which were not news and which were not popular with the readers of the papers. Confronted with these requirements the officers of the League set out to secure a reading public. They communicated with each highway commissioner in the twenty-eight towns of the county and obtained from each man the names and addresses of the overseers of the highway. As there was in the county 2,329 miles of highway, and an overseer in charge of each mile of highway, the League obtained a membership of upwards of 2,500 members, composed of highway commissioners, overseers, supervisors and people voluntarily sending their names in to be enrolled in the League membership. To each of these men a certificate of membership was issued, signed by the secretary and printed in red and black type stating that the member whose name was given was not only a member of the Oneida County League for Good Roads, but was entitled to such publications as the League might issue from time to time. This gave the League a mailing list which covered the entire county thoroughly and enabled them to obtain information in regard to all road questions, in any part of the county. With this large number of men as interested readers, the papers became willing to print matters pertaining to road improvement and strongly advocated the cause.

Every year the League for Good Roads holds conventions in different parts of the county, at which prominent speakers are present, and the different interests of the county harmonized. Through the local papers prizes are offered for the town making the greatest improvement in its highways.

In 1893 the Board of Supervisors, upon petition from the Good Roads League, sent out a committee to confer with the representatives of the towns in regard to improving the highways of the county. So illy understood by the farmer was the work of the committee, that the meetings were of a boisterous character, violent; and so threatening to any change in the road question, that the committee had to be called from its work. The sentiment of the county has now so changed that anything in regard to roads is almost unanimously approved.

\* Secretary Oneida County League for Good Roads.

## BENEFITS OF THE NEW SYSTEM

Information has been furnished throughout the county in regard to the benefits to be derived under the Higbie-Armstrong Act and under the adoption of the money system. In 1899 the town of Paris, by popular vote, adopted the money system and appointed Mr. Michael Gaffney highway commissioner. The town entrusted him with the expenditure of \$15.00 a mile to take care of its 80 miles of highway and so intelligently was the work done that Mr. Gaffney became a local hero, and the towns on all sides adopted the money system, until in Oneida County on January 1, 1902, 13 towns, having a thousand miles of highway, were under the money system, and in the adjoining counties of Herkimer, Otsego and Madison some 12 towns more had changed from the labor to the money system, all owing to the intelligent work done by Mr. Gaffney.

In 1899 the residents of the town of Deerfield petitioned for two and one-quarter miles of highway under the Higbie-Armstrong Act. When the road was completed it was satisfactory to the residents along the highway and the residents in the town of Whitesboro petitioned for a stretch of highway, which was completed in 1901 and was also satisfactory. The supervisors of the county then appointed an engineer to prepare a county road map showing all of the roads in the county which would be entitled to state aid under the Higbie-Armstrong Act. This map was completed in November, 1901, and the Board of Supervisors unanimously designated 251 miles of roads shown on the map for improvement by state, county and town aid under the Higbie-Armstrong Act. In 1900, through the efforts of Mr. Fred C. Walcott of New York Mills, the county prisoners were employed to construct a mile and a third of highway through the village of New York Mills under the same specification as required by the state for the road between the village of Whitesboro and the City of Utica, a mile and a third in length. The result was as follows: The state road cost \$9,500, the prison labor road under the same conditions cost \$5,873, making a saving in the cost of construction of \$3,627.

The method of road agitation in Oneida County has resulted in creating a class of readers interested in any article published in any paper that they see effecting the question of road improvement. While only a small portion of state road to the present date has been built in the county as a sample of what road construction should be, it has resulted in the laying out of a complete system of road improvement for the entire county, which, to the present date, has not been done by any other county in the state. It has also resulted in the intelligent employment of prison labor with competent and satisfactory records as to its value in road construction. Oneida County has tried intelligently every step of road progress permitted under the statute, and now with its intelligent plan of road improvement and its close touch with the former road builders of the county, is ready to make rapid strides in the improvement of its highways under the direction of a county engineer and under greater expenditures of state and county money.



BIRD'S-EYE VIEW OF GRAND RAPIDS



PUBLISHED MONTHLY AT 253 BROADWAY, NEW YORK CITY

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#### TERMS OF SUBSCRIPTION

(In advance.)

United States and Canada . . . . .	\$3.00 per year
Foreign Countries . . . . .	4.00 "
Single Copies, each . . . . .	.25

Entered at the New York Post Office as second class matter.

NEW YORK, AUGUST, 1902

### Pennsylvania Tunnel Contract Rejected

THE proposed tunnel franchise for the Pennsylvania Railroad Company, which has been approved by the Board of Rapid Transit Commissioners, was rejected July 22d, by the New York Board of Aldermen by a vote of 56 to 10. The press of New York is almost a unit in condemning this action of the Board of Aldermen, as it retards the progress of a most important project, but we commend the action of the Board. The Board acted in accordance with the report of its special committee on railroads, which recommended the rejection of the proposed contract between the Pennsylvania Railroad Company and the Rapid Transit Commissioners for these reasons:

"Because it does not provide for pipe galleries in the tunnel for the use of the city;

"Because no time limit is fixed on the construction; and

"Because there is no provision for the employment of union labor at the prevailing rate of wages."

If this proposed tunnel franchise had been approved by a rapid transit commission located in Philadelphia we would not have been surprised at its action, but how such a decision as it has rendered could come from a body of fair-minded men located in New York, we fail to understand. We understand how a similar commission in Philadelphia would be willing to grant so valuable a franchise in perpetuity without any restrictive clauses, but we are utterly astounded at the perpetration of so great a wrong by this Board. Under no circumstances should a franchise in perpetuity be granted. Furthermore, there should be no franchise granted without certain rights being conceded to the city, providing for pipe galleries, etc. The small sum offered to be paid annually for this proposed franchise is too insignificant to be mentioned. The Rapid Transit Commission has shown an unpardonable lack of civic patriotism in approving a scheme so evidently in favor of a private corporation. The action of the Board of Aldermen is not only to be commended, but it would be recreant to its trust if it failed to hold up a franchise containing such objectionable features.

It is to the credit of Borough President Cantor that he opposed the granting of the franchise as presented. In part he stated his reasons as follows:

"But we must remember that this franchise creates a monopoly in this city. It is not for the Pennsylvania Railroad Company, but for a distinct tunnel corporation, backed by Pennsylvania Railroad capital. We are asked to give that corporation the exclusive and perpetual right for connecting all the great railroads that come into this

city, and under bids opened yesterday the control to a certain extent of the outgoing travel on the Rapid Transit Subway.

"The terms of compensation may be readjusted every twenty-five years, but in every other respect the contract is an arbitrary one and will last for all time. I cannot agree with the Mayor and the Comptroller in approving such a franchise.

"It is almost a gift. The compensation is only \$75,000 a year. There isn't a franchise in the state that doesn't pay more than that in proportion to its value. Why not demand a percentage of the receipts or on the value of abutting property? If we reject this proposition to-day let our reasons be clearly stated as follows: That the compensation is inadequate; that the franchise is exclusive and perpetual, and that power of control is with the self-perpetuating Rapid Transit Commission, the only undemocratic body in the State. A franchise for this tunnel ought to be given and without delay, but it should be a proper one.

"If the Jersey Central," he said "or any of the other railroads that come to the west shore of the Hudson should want to cross to this city it would be practically impossible for them to do it because of this exclusive franchise. Furthermore, I am not sure that the terms of the proposed franchise do not exempt the tunnel company from the Ford Franchise Tax law. For these reasons I hope that the matter may lie over for a week to give us more opportunity for investigation."

Happily for the city of New York the decision of the Aldermen is final. The only thing left for the railroad company now is to renew its application if it still desires to go ahead with this project, on terms likely to be accepted by this Board of Aldermen, and it will be necessary for an entirely new contract to be drawn. It is to be hoped that the Board of Aldermen will not recede from its present position, and that it will further demand a limited franchise and the concessions mentioned.

It would be much wiser for the city to retain absolute control of the tunnel and lease it out to the Pennsylvania Railroad Company, or any other which might desire to use it. This can be done by granting certain concessions for a period not exceeding twenty-five years to a private company for constructing the tunnel. These concessions would afford ample reward to any private company for assuming the responsibility. In this way the indebtedness of the city would not be increased, the title of the property would be in the city's name, and the rights of the people would be protected.

### The Pennsylvania "Rippers"

FOR a number of years there has been a strong popular demand for a new charter in Pittsburgh. In 1897, a vigorous effort was made to secure one, which came near to success. The basis of the demand was the involved and inefficient form of government which had been drafted and adopted at the instance of the influential powers in the city's politics. Senator Quay in 1895 promised the reform element a new charter and at the session of 1897, he was called upon to fulfill his promises. Several bills governing cities of the second class, (then two in number, Pittsburgh and Allegheny), were introduced. The Quay people, however, soon recognized that a new charter put into force and effect by their opponents who were in control of Pittsburgh's government, would avail little or nothing. Then again, Allegheny, which was controlled by Quay's friends, wanted no change. Here was a dilemma which they sought, however, to solve with characteristic shrewdness. In the first place, a bill was introduced providing for a reclassification of the cities of the Commonwealth, so that Pittsburgh was transferred to the first class, and Allegheny left alone in the second class. Secondly, a provision, since known as the "ripper" clause, was introduced, the effect of which, if adopted, would have been to have vacated all the elective offices of a city transferred from one class to another. Both bills failed of passage. Nothing was done in 1899 because of the Senatorial deadlock, and the matter of new charter legislation was allowed to rest until the 1901 session of the legislature, of which Quay and his friends were in full control. They proceeded to use their power to drive out of office the forces that had been opposing them in Pittsburgh for so many years. This was done through the passage of what has since come to be known as the "Ripper Bill," the formal



title of which is "An Act for the Government of Cities of the Second Class." It affects Pittsburg, Allegheny and Scranton, which, by the census of 1900 passed into the second class. The Act contains twenty articles and is intended to provide a comprehensive scheme of government for the cities named.

It was so faultily drawn, however, that an amendatory act was needed to correct the defects. The really objectionable features of the Act are contained in Section I of the schedule, which gives to the Governor of the State, after abolishing the office of Mayor, the right to appoint a "City Recorder to serve until the first Monday of April, 1903, (more than two years after the passage of the Act) and the appointee and his successors are subject to removal by the Governor until the first Monday in April, thus constituting one of the most flagrant instances on record of the subjection of a municipality to the necessity of a political organization through the instrumentality of a state legislature.

Already this power has been exercised in the case of Allegheny once and once in the case of Scranton. In Pittsburg Major A. M. Brown was appointed Recorder to succeed Mayor Diehl, who had been elected under the old charter. Recorder Brown proceeded to use the large powers invested in him by the Act and dismissed large numbers of city employees, appointing men who were unfriendly to Senator Flinn, who had been the "boss" or "leader" of the city. Before many months had passed, however, the Senator made his peace with the Governor, and loyally supported the state ticket dictated by the latter and his friends and which contained the name of the Governor's former law partner for the office of Judge of the Supreme Court. The consideration of this support was the removal of the newly appointed Recorder, who refused to change his policy to suit the changed condition of affairs and the appointment of J. O. Brown, a follower of the Senator. Then followed another wholesale removal of officials to reinstate the previously deposed Flinn men and to punish those who had had the temerity to make their peace with the first Recorder during his reign. Thus the Act was made to serve the ends of the very man whom it was intended to drive out of power and politics.

There will be no election for Recorder until next year, but a strong, independent fight was waged in February by the people under the leadership of George W. Guthrie, to control the Councils and thus checkmate the power of the state and city organizations, and this succeeded by an overwhelming majority, although the machine polled a vote 2,000 in excess of its largest previous vote; nevertheless its ticket was defeated by 9,000 and more votes, upward of ninety per cent. of the assessed voters exercising their franchise. This overwhelming defeat, however, has, in no wise, abated the "rippers" in either Allegheny or Pittsburg. The Governor wanted a solid delegation to the state convention from Allegheny county for his gubernatorial candidate, Attorney General John P. Elkin. He expected to get it through his Recorders in Pittsburg and Allegheny. He did not get what he wanted, and the following quotations from the *Philadelphia Record* of June 16, tells what happened: "Governor Stone is making himself heard from. The Allegheny county delegates who deserted Elkin and went over to Pennypacker are feeling the weight of executive displeasure. They and their friends are being ripped out of office wherever the arm of state and municipal authority can reach them."

The same power will be used again no doubt, but thus far it has worked harm and disaster to those who enacted it. The faction that was supposed to be the first beneficiaries had their Recorder supplanted by a hostile one; the present Recorder and his machine have been vigorously defeated at the polls, and the Governor's candidate for his successor was set aside by Senator Quay and other influential Republicans because of his connection with the legislature which has become very unpopular in the state, and now the president of the State Bar Association (who is connected with a law firm that has represented the Republican organization interests on more than one occasion) denounces in unmeasured terms the decision of the Supreme Court upholding the "Ripper" act.

It is extremely doubtful if there will be ever again, at least within the present generation, so flagrant an attempt to deprive three great cities of the ordinary powers of home rule. It is indeed a lesson

carefully to be studied by those who would use the power of government to serve personal political ends, to see how disaster has followed in the wake of this most notorious and wholesale attempt to rob over half a million of people of their municipal rights and to trample upon their power to select their own municipal agents.

CLINTON ROGERS WOODRUFF.

### Permanent Health Officers

THERE are some officials of a city whose tenure of office should depend wholly upon ability, good behavior, and efficiency, because they hold a vital relation to the community which they serve. To change such an official every one, two, three, or more years is not only a detriment but a menace to public welfare. There are some officials whose duties require the training of experience, and frequent changes are sure to defeat the purpose for which the office is created. The health officer is one who should remain undisturbed in the administration of a city's affairs. Dr. W. C. Woodward, Health Officer of the District of Columbia, recently called attention to this question in a discussion of "Some Problems in Municipal Sanitation from an Executive Standpoint." He said in part:

"The difficulty in securing competent officers in the contagious disease service and competent chemists and bacteriologists to take care of the laboratories arises chiefly from the uncertain tenure of office and the inadequacy of compensation. The British Medical Association has been instrumental in securing the introduction in the House of Commons of a bill which seeks to amend the law relating to the tenure of office and medical officers of health and sanitary inspectors. In England, at present, the medical officer of health is appointed for one, three or five years, and the sanitary inspector for one year. The bill provides that properly educated and qualified men shall be appointed to these offices and shall be secure in their position as long as they perform their services satisfactorily. The duties of officers of health are indicated by the teachings of modern science and can not vary with the whims of each new mayor or governor who happens to be elected to office. Matters of public sanitation have become so manifold that special education and experience are necessary for the proper administration of them. The public can only obtain the best service when those who look after the public health are secure in their positions as long as their duties are properly performed, and when they are relieved of the distracting necessity of keeping on the right side of politicians in order to retain their places. The treatment of medical health officers in one of our western cities at the hands of lay authorities, who claim to determine the absence of plague by their individual feelings and desires, is most deplorable, and has subjected the rest of the country to a most unnecessary danger. The absolute separation of all matters of public health and hygiene from changeable politics is much to be desired and is to be constantly sought by the medical profession."

### EDITORIAL COMMENT

According to a local paper, the city of Toledo has no building inspector. We wonder how many other cities of this size have none? This is a matter that should receive the earnest attention of every executive officer of every municipality in the land. Negligence of this sort is little short of criminal.

By reason of sweeping decisions made by the Supreme Court of Ohio, nullifying or modifying the charters of a great many of her municipal governments, Governor Nash has been compelled to issue a proclamation calling an extra session of the Legislature for August 25th, for the express purpose of drafting a new code for the government of Ohio cities. More than three years ago a special commission was appointed to draft a code bill which should take the place of the existing municipal code. The bill has been considered and rejected by two sessions of the Legislature, and without good reason, for a more equitable and just municipal code does not exist

than was presented by the commission to the Legislature for its adoption. Governor Nash has a committee of lawyers drafting a new municipal code. At the same time others are preparing theirs, so that a fight between the advocates of the various plans is sure to take place. What the outcome will be can only be conjectured. In forced legislation, however, unsatisfactory results are more than likely to follow. There is not state in the Union where the need of a uniform municipal code is more sadly felt than in Ohio. With one or two exceptions, there are no cities in the state which have the same charters. It is to be hoped that this forced opportunity to secure a new municipal code will reach a happy result.

It appears from our contemporary, *The Star*, of Kansas City, that that city proposes to pay the street railway system for sprinkling its tracks and the street contiguous thereto. The taxpayers of Kansas City must have "money to burn" if they can afford to give such a corporation a valuable franchise and then pay it to do work which in other cities it is glad to do for nothing.

Many city officials have already made preparations for attending the sixth annual session of the League of American Municipalities, to be held at Grand Rapids, Mich., August 27th, 28th and 29th. For the first time in several years New York City will be represented. The Hon. Jacob A. Cantor, President of the Borough of Manhattan, has consented to take a place on the programme and will be present. He will be accompanied by a delegation from New York City. Arrangements are being made to run a special excursion from New York City to Grand Rapids. A rate of fare and a third for the round trip ticket has been granted by the Trunk Line Association. Any officials desiring to join this special excursion can learn further particulars by addressing the Editor of *THE MUNICIPAL JOURNAL*, 253 Broadway, New York.

The city of San Francisco is agitating the question of a higher saloon license. The Merchants' Association recently took a poll of its membership voting upon the following questions: (1) Do you favor increasing the retail liquor license? (2) Do you favor a flat rate of \$400 per annum here? (this is about the average in other California cities). (3) If not, what rate do you favor? (4) Do you favor a graded license instead of a flat rate? The returns up to date show that fifty-one are opposed to an increase of the retail liquor license; 737 are in favor of an increase; and there is a plurality of 348 favoring a flat rate of \$400. San Francisco has a lower license than any other large city in the United States. There are only two cities, large or small, which have lower rates, and these are Nashville, Tenn. and Evansville, Ind. Moreover, it has more saloons than any other first-class city in proportion to the population, while it does not receive the income from the saloons that other cities do. So long as the traffic is regulated by licensing there is no good reason why it should not be made to yield the largest returns.

Fire commissioners and chiefs should not forget to make preparations for attending the next meeting of the International Fire Chiefs, which will be held in New York City, September 16th to 19th inclusive. To be entitled to all the privileges of the convention it is necessary to send five dollars to the Secretary, Henry A. Hills, Wyoming, Ohio. Upon receipt of the membership fee Mr. Hills will send the necessary credentials. This should be attended to at once so as to avoid confusion and delay on the first day of the convention. A badge will be given only to those who have the necessary credentials, and the splendid entertainment which New York City will set up can only be enjoyed by those who wear badges.

The Merchants Association of New York is one of the powers behind the throne of the municipal affairs of the city. It is one of the potent influences for good. Its power was first felt in the Ramapo fight, when it saved the city from a money grab of \$200,000,000. It has always been willing to fight the fight of municipal righteousness and to co-operate with any administration, but unfortunately Tammany has not felt free to avail itself of such aid. Happily for the taxpayers, the present administration welcomes a helping hand from

every source whether from the Merchants Association or elsewhere. The latest step toward civic righteousness in New York has been taken by the Merchants Association in providing the means for securing a correct system of accounts for every department. At the expense of many thousands dollars, a most thorough investigation of every department will be made by Mr. Worthington C. Ford, formerly the Chief of the United States Bureau of Statistics, and now head of the Boston Public Library, who has been employed by the Association to take charge of this investigation of the different city departments. Mr. Ford will be assisted by a corps of experts and will be given every opportunity to create a system of accounting for Greater New York that will be second to none in the country. It is estimated that the proposed plan will reduce the city's expenses at the rate of at least \$25,000,000 a year. This will cut the annual expenses of the city down to about \$80,000,000, but even this is too large a sum to expend for the maintenance of even this large city, when it only costs about \$65,000,000 to run the city of London, which has an area of 777 square miles as compared with our 308; a police department with 14,000 employees as compared with our 7,000. It is hoped that after the plan is thoroughly installed that even a greater saving may be effected.

## LETTERS TO THE EDITOR

### A Hand Pick-Up Street Sweeper

—, Md., July 12, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

I am in search of a hand power, or push pick-up street sweeper, to be used by one man. I do not find any advertisement in your paper, but thought you would probably know if such a machine is made. The only one of which I know is the one made by a local company in Washington, D. C.

G. E. LEWIS.

There is only one other hand street sweeping device beside the one you mention, made, and that is known as the Menzies' Street Cleaner, manufactured by the Menzies Street Cleaner Company, Glens Falls, N. Y. An illustrated description of this street sweeper is given elsewhere in this number.—[Editor.]

### Qualities of Asphalt Pavements

—, Wis., July 18, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

Mr. M. O. Eldridge, Acting Director of the Office of Public Roads Inquiries, Washington, D. C., has referred me to you for information concerning the durability, and general data relative to the cost and wearing qualities of asphalt pavement.

Our city is conducting an investigation of various forms of pavement with a view to adopting a new policy in the city, and I have been asked to look into parts of it.

If you can favor me with any articles, or information which will lead me to any articles on this subject, it will be much appreciated.

STANLEY C. HANKS, ESQ.

The following articles relative to asphalt pavements have appeared in the MUNICIPAL JOURNAL AND ENGINEER during the last year and a half:

*February, 1901*: "Asphalt Pavements," by George W. Tillson, Chief Engineer of Highways, Brooklyn, N. Y.; "Table of Cost of Asphalt Pavements, Including Base, Binder and Wearing Surface," compiled by F. V. E. Bardol, former City Engineer of Buffalo, N. Y. This table is exceedingly valuable and doubtless will contain much information that will interest you.

*April, 1901*: "How to Prepare Asphalt Pavements," by Robert Hook, City Engineer, Chattanooga, Tenn.;

*June, 1901*: "Streets and Street Pavements," by H. G. Tyrrell, C. E., Boston, Mass.;

*July, 1901*: "The Use of Asphalt Pavements in German Cities," by Emil Kuichling, C. E., Rochester, N. Y.;

*November, 1901*: "Asphaltum and Its Compounds in Nature," by



J. W. Howard, Engineering Editor of the MUNICIPAL JOURNAL AND ENGINEER;

January, 1902: "Open Specifications for Asphalt Pavements," by M. D. Coffeen, Chicago, Ill.;

May, 1902: "Correct Asphalt Specifications," an editorial by J. W. Howard, Engineering Editor of the MUNICIPAL JOURNAL AND ENGINEER;

June, 1902: "New York's New Asphalt Specifications."

In addition to the above we would refer you to two books: "Street Pavements and Paving Materials," by George W. Tillson, Chief Engineer of Highways, Brooklyn, N. Y., published by John Wiley & Sons, New York City, price \$4; "City Roads and Pavements," by William Pierson Judson, C. E., Oswego, N. Y., published by The Engineering News Publishing Company, New York City, price \$2.—[Editor.]

### Sewer Assessment Apportionments

—, OHIO, July 17, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

In our city the cost of constructing sewers is apportioned as follows: For both lateral and main sewers the property owners only pay 60 per cent. of the entire cost, while the city pays the balance. There is no distinction made where adjoining property owners already use strictly sanitary sewers. Believing that the city's portion of the cost, viz., 40 per cent. is excessive, I therefore write to ascertain if I can receive any information through your journal upon the subject, especially as to the proportion paid by the principal cities in Ohio.

AUGUSTUS W. MITHOFF, *City Solicitor*.

We have very little of this information on hand, and have been unable, therefore, to send a satisfactory reply to our inquirer. We have sent a circular letter to the various cities in Ohio asking for the desired information, which will be tabulated and published as soon as received. In the meantime we should be pleased to have the officials of other cities inform us as to their practice. As soon as received we will take pleasure in forwarding to Mr. Mithoff.—[Editor.]

### How to Set Stakes for Paving Streets

—, O., July 14, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

Will you give me the name of a book which gives instructions in detail as to the setting of stakes for preliminary work in paving streets, so that any engineer may follow them without error?

W. R. BLAKE.

There is no book which treats of this subject alone. The practice among engineers varies. The following suggestions as to the practice of one engineer may be of assistance to you.

Each street generally becomes a special case. It is necessary to assume that the street to be paved has already been laid out and had its sidewalks and roadway made to conform to the general size and dimensions desired, and that the time has come to replace an earth or a macadam roadway with a more permanent street surface of granite, asphalt or other pavement. The longitudinal grade, or fall of the street, will vary from block to block, and often differs along the curb line of opposite sides of the same block. It is not possible to arrange for drainage and have the gutters and top of the curbstones on opposite sides of a street in the same horizontal plane or planes parallel to each other.

The new curb stakes are generally set along the line of the proposed curb so as to be higher than the curb. The stakes are numbered and a profile drawing of each side of each block is made with the stakes indicated by numbers and how much in inches and fractions the top of the curb is to be below the top of each stake. In case it is to be above any stake it is so marked. If an old curbstone is present

a vertical line is painted upon it with a number. Then the profile drawing indicates with plus or minus signs how many inches above or below the present curb at the different points the old curb is to be adjusted or a new curb laid. The workmen in every case must use a tight cord set along the upper outer corner where the new curb is to lie.

The question of depth of curb or height above the finished pavement is determined by the longitudinal fall of the street, location of inlets to sewers at short or long intervals, the elevation of one sidewalk above that of the opposite sidewalk and other local conditions. The stakes for the cross section or contour and crown of the pavement are set in parallel rows across the street. These rows for good work should be fifteen or less feet apart and there should be at least five lines of stakes parallel to the curbstones. One line of stakes must be at the center of the street or when the highest point of the crown is at one side of the center as it must be when one curb of the street is higher than the other. Two lines of stakes are one on each side of the street against the curbstones. Two more lines of stakes, all lengthwise of the street, are called the quarter stakes. Each one of these two lines is one-half way between the gutter stakes at the curbs and the line of crown stakes. The best practice is to drive the stakes so that their tops will be flush with the top of the concrete or other foundation of the pavement, before the foundation is laid. The stakes must be watched during the grading of the earth around them and promptly replaced with an instrument or other safe method if displaced. The grading should be to the depth required for the foundation, now generally five inches for good concrete. As the concrete is laid very thin, stakes should be inserted in the concrete at the side of each grade stake, so as to find the grade stakes and check the work. The grade stakes may be left in position, or, when inspected and approved, after the setting of the concrete the grade stakes can be driven down or pulled out and a little concrete used to fill the small holes. The depth of the pavement surface material is measured otherwise than by stakes. If of asphalt, bituminous macadam, or other composition, its depth is measured during construction with a special notched stick or a rule; but if of stone, or other blocks, they have their own depth.

There are several formulæ for determining the contour of a pavement, and according to which the top of the grade stakes should be set. Large cities of Europe and a few in America make the gutters for about a foot parallel to the curb, have a flat cross section; but it is generally good practice to have the rise begin at each side of the curb. In Liverpool the rule of the Engineers is to make the inclination from the top of the ground to the gutter a fall of one inch in twenty-six inches of distance. In this case the result is a roadway with almost straight lines from the center or from the axis of the crown each way to the curb. In other words, if the height of the center is called 1, the heights of  $\frac{1}{4}$ ,  $\frac{1}{2}$  and  $\frac{3}{4}$  the distance to curb will be represented by 0.35, 0.65, 0.87. In London the fall from the crown to a curb is made about 1 in 45 on a very few streets but on a street with heavy traffic which is cleaned at intervals a fall in 1 in 70 is used.

In Berlin about 1 in 60 is used. These grades are especially adapted to smooth pavements. A width of about six feet in the center of the street, or three feet each side of the crown, is rounded. Washington used about 1 in 50 and Buffalo 1 in 40. New York is about the same as Washington. The maximum limit in general practice for pavements can be taken as follows:

For a roadway twenty feet wide, have the highest point five inches above the gutter; for thirty feet, six inches; for forty feet, seven inches; fifty feet eight inches. But, where possible, and when the streets are cleaned at intervals, it is permitted to use from one-half to one inch less than above given. It is also good practice to raise the tops of the two lines of quarter stakes so that a moderate curve will be described along the tops of the five stakes, of each row crosswise the street.

If one curb is higher than the opposite curb the highest point of the crown is generally along the side of the street nearer the highest curb, especially when it is not possible to make the depth of the gutter on the upper side greater than on the lower side. That which must be avoided is a steep, lateral incline which would cause vehicles to slide or work sidewise to the edge of the pavement.—[Engineering Editor.]

### Salaries Paid to Patrolmen

—, GA., July 17, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

Please send me at your earliest convenience what information you have relative to salaries paid to patrolmen in different cities of about 90,000 population.

JAMES L. MAYSON, *City Attorney.*

In response to the above request we have compiled from the reports which we have on hand, the following table:

City.	Population.	Pay of patrolmen per year.
Augusta, Ga.	39,441	\$720
Albany, N. Y.	94,151	900
Allegheny, Pa.	129,896	950
Baltimore, Md.	508,957	936
Boston, Mass.	560,892	1,000 to 1,200
Brockton, Mass.	40,063	900
Bridgeport, Conn.	70,996	960
Buffalo, N. Y.	352,387	720 to 900
Cambridge, Mass.	91,886	1,095
Canton, O.	30,667	715
Chicago, Ill.	1,698,575	1,000
Cincinnati, O.	325,902	780 to 1,020
Cleveland, O.	381,768	780 to 1,000
Dayton, O.	85,333	780
Detroit, Mich.	285,704	700 to 900
Des Moines, Ia.	62,139	720
Evansville, Ind.	59,007	819
Fall River, Mass.	104,863	958
Fort Wayne, Ind.	45,115	780
Grand Rapids, Mich.	87,505	748
Indianapolis, Ind.	169,164	825
Jersey City, N. J.	206,433	1,000
Jackson, Mich.	25,180	700
Kansas City, Mo.	163,752	840
Lawrence, Mass.	62,359	912
Louisville, Ky.	204,731	821
Memphis, Tenn.	102,320	900
Milwaukee, Wis.	285,315	960
Minneapolis, Minn.	202,798	900
Mobile, Ala.	38,469	600
Nashville, Tenn.	80,965	810
Newark, N. J.	246,070	1,095
New Bedford, Mass.	62,442	1,003
New Haven, Conn.	108,027	1,095
New York, N. Y.	3,437,202	800 to 1,400
Norfolk, Va.	46,624	820
New Orleans, La.	287,104	600
Omaha, Neb.	102,555	840
Oakland, Cal.	66,960	1,200
Peoria, Ill.	56,100	780
Philadelphia, Pa.	1,293,697	1,003
Pittsburg, Pa.	321,616	912
Providence, R. I.	175,597	1,095
Quincy, Ill.	36,252	660
Springfield, Mass.	62,059	900
Scranton, Pa.	102,026	900
St. Louis, Mo.	575,238	1,000
St. Paul, Minn.	163,065	840
Salem, Mass.	35,956	912
San Antonio, Tex.	53,321	780
San Francisco, Cal.	342,782	1,224
St. Joseph, Mo.	102,979	840
Syracuse, N. Y.	108,374	900
Trenton, N. J.	73,307	780
Tacoma, Wash.	37,714	720
Troy, N. Y.	60,657	850
Washington, D. C.	278,718	900 to 1,080
Williamsport, Pa.	28,757	600
Wilmington, Del.	76,508	760
Worcester, Mass.	118,421	1,003
Youngstown, O.	44,885	840
Yonkers, N. Y.	47,931	1,200

—[Editor.]

### Uses of the Book-Typewriter

—, N. Y., July 12, 1902.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

Can you tell me where I can secure samples of work of a book-typewriter. I have been authorized to purchase one for work in my office, but before doing so I would like to have the names of a few cities which are now using a book-typewriter, and if possible, some samples of its work.

LEWIS A. MILLER, *City Clerk.*

We have obtained a partial list of the cities where the Elliott &

Hatch Book-typewriter is in use, as follows: John T. Barr, City Clerk, Columbus, O., two machines; Bureau of Water, Philadelphia, Pa.; B. J. Coutant, City Clerk, Newburgh, N. Y.; Department of Health, New York; Town Clerk, Ansonia, Conn.; Town Clerk, Danbury, Conn.; The Mayor, Harrisburg, Pa.; Town Clerk, West Hoboken, N. J.; Town Clerk, Tompkinsville, Conn.; Town Clerk, Stamford, W. Va.; City Clerk, Middletown, N. Y.; City Clerk, Kokomo, Ind.; City Collector, Jersey City, N. J.; City Clerk, Michigan City, Ind.; Supt. of Water Department, Allentown, Pa.; City of Duluth, Minn.; City Clerk, Bradford, Pa.; City Clerk, Valley Falls, R. I.; City of Allegheny, Pa.; Town Clerk, Stamford, Conn.; City Commissioners, Philadelphia, Pa.; City Clerk, Oakland, Cal.; City Clerk, Springfield, Ill.; City Clerk, Canton, O.; Town Clerk, New Britain, Conn.; Board of Police, Newark, N. J.; Town Clerk, Bridgeport, Conn.; City Clerk, Marion, Ind.; Street and Water Commissioners, Newark, N. J.

This is an incomplete list. Many more could be given if desired.

We sent a letter of inquiry to several of the city officials who are now using a book-typewriter, and among the replies received one from Bradford, describing the uses to which the Elliott & Hatch book-typewriter is put. City Clerk Charlton in replying to our letter writes as follows:

"Have been using an Elliot & Hatch Book-typewriter machine for the past year and have found that it is a real necessity in a municipal record office, saving time and labor. Besides making legible work the operator takes more pains in copying the full contents of communications, resolutions and ordinances, giving a better and more complete record. It has a tabulator attachment so that when bids are received or statements of work or construction are read they can be placed in the journals in better shape than by pen and are able to be read by any one who wishes to inspect the records.

"In this office I not only use the machine for entering the proceedings of the Councils in the journals, but use it in making up the tax duplicates, license tax assessments, card system, letters, addressing envelopes, making out bills, statements and very nearly all work that was formerly done with a pen.

"The advantage of the machine lies in the fact that the operator can write on a thick card, in a large book or a small one, just as well as on an ordinary letter head, and five or six envelopes can be addressed very easily without the necessity of taking each out and inserting the next.

"I suppose that my system of records would be of interest to city officials and will explain it in the shortest way possible.

"Upon the introduction of an ordinance it is registered by introduction file or calendar number and placed by title on index card which shows the action by Council as it passes or is lost. After it has received the Mayor's signature, it is filed away by stationery number, for example, an ordinance may be introduced as ordinance number 1 and filed under file number 4 after approved by the Mayor.

"Letters are filed by title and in packet numbers. Resolutions are filed by number and placed in packages. The card shows whatever subject comes up and also shows where it appears in the journal and what journal; also ordinance number, letter packet number and resolution number. Streets are shown in alphabetical order under "S," and all that occurs relative to a certain street appears on the card, as reference numbers so that any given subject can be referred to at a small loss of time and the original can be seen very quickly."

—[Editor.]

### Duplicate of City Taxes, 1902.

NAME	TENANTS	No. Street.	STREET	Valuation	CITY 10 Mills	Poll	POOR 2 Mills	New Building 100 Sinking Fund 1-4 Mill	New Building 100 Sinking Fund 1 Mill	Refunding Bond 100 Sinking Fund 2-5 Mill	Improvm't Bond 100 Sinking Fund 3-5 Mill	Main & Cong 100 Sinking Fund 1 Mill	TOTAL
Ferry, D.M.	1 John Jones	15	Congress	10,000	100 00	1	20 00	2 50	10 00	4 00	6 00	10 00	152 50
	2												
	3												
	4												
	5												

SAMPLE OF THE TABULATING WORK OF THE BOOK-TYPEWRITER



### Personalities

—James Sullivan, mayor of the city of Shakopee, Minn., died suddenly of heart disease on July second.

—Dr. J. G. Riddick assumed the office of mayor of Norfolk, Va., on July first. Mr. Nathaniel Beaman is the retiring official.

—James H. Seymour, eldest son of Mayor Egbert Seymour, of Bayonne, N. J., was drowned July 5, while on a yachting trip.

—The term of Mayor Morse, of Newport News, Va., began on the first of July. This is the fourth time that Mayor Morse has been at the head of affairs in this city.

—The city of Elizabeth, N. J., has recently unveiled a statue of William A. Mack, who died January, 1901, while mayor of that city. This is said to be the first monument ever erected in the state of New Jersey to a deceased mayor.

—Highway Commissioner T. T. Wierman, of Harrisburg, Pa., has resigned his position after a brief service of about three months. Mayor McCormick recommends the abolition of the office and its combination with that of the City Engineer.

—James H. Fuertes of New York is the consulting engineer for the water supply of Harrisburg, Pa., as well as for the other improvements contemplated there. He will direct the studies for designing the new filter with the assistance of Charles G. Hyde.

—Mr. Burton J. Ashley, city engineer of Zion City, Ill., has moved his headquarters from Chicago, where he has been located for the last three years, to Zion City. He will occupy a spacious suite of rooms in the Administration Building of that city. Zion City has a population of 5,000.

—Major H. C. Cushing, U. S. A., died at his home in New Rochelle, in July. Major Cushing was appointed Superintendent of Street Cleaning under Col. Waring in New York, and with Capt. Gibson, now Deputy Street Cleaning Commissioner, organized the famous "white wings" brigade.

—The Court of Appeals of Kentucky has decided against T. S. Pettit in his suit against Martin Yewell, for the office of mayor of the city of Owensboro, Ky. The contest was brought on the ground that while Mayor Yewell had received the majority, he was not eligible to office because he was not a freeholder at the time of the election. The court, however, decided adversely to these claims.

—City Clerk W. M. O'Brien, of Owensboro, Ky., recently refused to sign the bonds for a new water works system, on the ground that they were invalid. The test case to determine their validity resulted in the bonds being declared good, and the city clerk thereupon immediately affixed his signature. He is to be commended, however, for his stand, for, if he had been right in his supposition, great trouble might have resulted.

—Mayor Tom L. Johnson, of Cleveland, O., has received a serious setback in his project of introducing a three-cent-fare railway. The franchise secured for this road was declared illegal by the Circuit Court but no appeal will be made by the mayor to the Supreme Court. Mayor Tom says that he will re-advertise for bids for another franchise and will begin all over again to fight for the installation of these cheap-fare railways.

—Mr. James M. Hill, Clerk of the Board of Water Commissioners, of Middletown, N. Y., has resigned his position, to take effect in July last. Mr. Hill has been in bad health for some time due to the press of work, and he has decided to give up and go to Denver, Colorado, to recuperate his health. In accepting his resignation the board takes occasion to praise the system of bookkeeping inaugurated by Mr. Hill, which has placed the affairs of the water department in the best condition.

—In his annual message Mayor Jephtha D. Ryan, of Leavenworth, Kansas, takes up the matter of municipal ownership especially in reference to the water supply in that city. He calls attention to a report of a former Mayor Edmond, which urged the city as far back as 1898, to take proceedings for the ownership of the works. Mr. Ryan outlines what has been done toward securing the works of the water company, and says that if it were not for the serious illness

of the City Attorney it is probable that the matter would have been settled by this time.

—The Board of Councilmen of South Norwalk, Conn., has received the resignation of A. E. Winchester as electrical commissioner. Mr. Winchester said that inasmuch as for the last four years he had held the positions of Electrical Commissioner and Superintendent of the electric works, he has been obliged to act as the director of his own actions as general superintendent, and inasmuch as he considers this an anomalous position, he decided to resign from the commissionership. His success in running the plant, which is owned by the city, has determined him to continue in his duties as superintendent.

### Convention Dates

#### AUGUST

The tournament of the Illinois Firemen's Association will be held at Blue Island, Ill., August 5-7. Walter E. Price, Champaign, Ill.

The American Park and Outdoor Association will hold its sixth annual meeting at Boston, Mass., August 5-7. Warren H. Manning, secretary, 1101-4 Tremont Bldg., Boston.

The Nebraska State Firemen's Association will meet at Grand Island, Nebraska, August 5-7. J. G. Halberle, Broken Bow, Nebraska.

The Connecticut State Firemen's Association will hold its nineteenth convention at West Haven, Conn., August 12-13. John S. Jones, secretary, Westport, Conn.

The Thirteenth annual convention of New York State Firemen will convene at Hudson, N. Y., August 18-22. Henry Buxbury, secretary, Hudson.

The sixteenth annual convention and celebration of the Virginia State Firemen's Association will be held at Portsmouth, Va., August 20-22. G. C. Cummings, secretary, Portsmouth.

The League of American Municipalities will hold the annual convention at Grand Rapids, Mich., August 27-29. Hon. John MacVicar, Des Moines, Iowa.

The Pacific Coast Association of Fire Chiefs will hold its annual convention at Victoria, B. C., in August. H. W. Bringham, Seattle, Wash.

#### SEPTEMBER

The convention and tournament of the Iowa State Firemen's Association will be held at Davenport, Ia., September 1-4. H. Horan, secretary, Muscatine, Ia.

The fifth convention of the National Firemen's Association meets at Detroit, Mich., September 11-12. D. W. Gillen, secretary, 176 E. Monroe street, Chicago, Ill.

The Association of Chiefs of Police of the Pacific Slope will meet at Portland, Ore., September 16. Chief Hodgkins, Oakland, Cal.

The Central States Water Works Association will hold its annual convention at Indianapolis, Ind., September 23-25.

The International Association of Fire Engineers will hold its convention at New York City on September 16-19. Henry A. Hills, secretary, Wyoming, O.

The New England Water Works Association meets at Boston, Mass., September 10-12.

#### OCTOBER

The International Association of Municipal Electricians holds its seventh convention at Richmond, Va., October 7-9. E. P. Foster, secretary, Corning, N. Y.

The twenty-third convention of the Pennsylvania State Firemen's Association meets at Bradford, Pa., October 7-10. W. W. Wunder, secretary, Reading, Pa.

The annual convention of the American Society of Municipal Improvement will be held on October 7-10 at Rochester, N. Y. E. A. Fisher, president, Rochester, N. Y.

The American Street Railway Association will meet at Detroit, Mich., October 8-10. T. C. Penington, 2020 State street, Chicago, Ill.

#### DECEMBER

The thirtieth annual meeting of the American Health Association will be held at New Orleans, La., December 8-12. Dr. Chas. O. Probst, secretary, Columbus, O.

## NEWS AND PRACTICE AMONG THE CITIES

### Municipal Acetylene Plants—Garbage Crematory Rules—New Charter for Atlanta—Improved Taxation Methods—Oiled Roads Favored

**CHICAGO TO ELEVATE TRACKS.**—The City Council of Chicago has passed a track elevation ordinance. This is the first ordinance to bring track elevation within a mile of Union Station. It provides for an elevation of ninety-five miles of tracks and for twenty-two subways and abolishes twenty-seven street crossings and four viaducts. It is estimated that the work will cost \$3,500,000.

**ONE HUNDRED YEARS OLD.**—The city of Waterville, Maine, celebrated its one hundredth birthday on June 23rd. Great plans were made for properly observing the day and the whole city gave itself up to the festivities. One of the most important events for the city was the handing over to the authorities of the keys of the new City Hall, which had just been completed.

**NEW BOULEVARD SCHEME FOR PHILADELPHIA.**—The Council of Philadelphia has been asked to pass an ordinance providing for the building of a boulevard from the City Hall to Fairmount Park. The plan provides for a thoroughfare 275 feet in width to run in a straight line from the City Hall to the Park, cutting through Logan Square. It will be necessary to remove many buildings to make way for this street, and much opposition has already arisen on the part of some Councilmen and residents along the route.

**STREET WATERING IN HAVERHILL.**—City Engineer Robert R. Evans in his last report states that the total length of streets in Haverhill, Mass., that were watered was 23.42 miles, the cost of the department being \$8,977.47. The total amount of assessment levied for this purpose was \$7,049.78, being at the rate of 3 cents per foot for frontage on unpaved streets and 4 cents per foot on paved macadam streets. Where a street was newly macadamized the expense was borne by the city, inasmuch as it was necessary to water it to preserve the macadam.

**SHAFT VENTILATORS FOR SEWERS.**—The abolishing of the ventilation of sewers by manholes has been followed in England by the more practical method of ventilation by shafts. One objection to the shafts has been the blocking at the foot of the shaft by rust, but this has now been obviated by constructing a special rust chamber at the base large enough to hold all the rust that would accumulate in two or three years. The chamber is fitted with an air tight cover and a removable dirt box, which will allow the rust to be removed. These ventilating shafts are constructed according to ornamental designs and extend for over twenty-five feet out of the ground.

**THE CITY TO TEACH FARMING.**—The Park Department and Board of Education of New York City, N. Y., have set apart 125 square feet of a small park for the purpose of teaching farming to the children in the neighborhood. The children will do the planting and will take care of the crops, each child to have a small plot of ground set off as a vegetable garden, and he will be responsible for that plot during the vacation season. The tools, as well as the seeds, are to be furnished by the city, and teachers from the Board of Education will instruct the children in the work. The children will have a police force of their own to protect the crops from bugs and other depredators during the day time, while the city police will look after the vegetables during the evening.

**CITY OFFICE BUILDINGS FOR NEW YORK.**—Comptroller Grout, Mayor Low and the Sinking Fund Commission have been considering seriously the construction of a large office building for the accommodation of the city departments, which are now housed in private buildings about the city. The Comptroller considers that enough money could be saved by the construction of such a building

to pay the interest and sinking fund charges on the bonds issued. Between \$500,000 and \$600,000 is annually spent in office rent at the present time, and the Comptroller considers that half of this could be saved if a municipal building were erected. Such a building would cost \$4,000,000, and the interest and sinking fund charges on the bonds would aggregate about \$240,000, showing a saving of \$60,000 a year.

**PURE WATER IN GALLIPOLIS.**—The filter system in Gallipolis, Ohio, has been in operation since 1894. It is stationed at the head of a natural sand bar in the Ohio River, and the main pipe crosses a narrow channel of the river and connects with a pumping station by a well and tunnel. The system has been a complete success since its installation, the pumps having never been stopped by sand or silt getting into the wells, as the water is all taken from the bottom of the well. The wells are cast iron, four feet in diameter and six feet deep and are set in a natural bed of sand and gravel. The top of the well is on a level with the low water line and is about five feet below the surface of the gravel bed. The water flows in from the bottom. The system yields under one pump 1,500,000 gallons per day. No matter how muddy the water in the river is that in the pipes is perfectly clear and pure.

**TREES CAUSE TROUBLE.**—City Engineer W. B. Chase, of Portland, Oregon, reports that while the greatest advancement in public work has been made in the direction of sewer construction, many of the old sewers have given considerable trouble on account of the roots of poplar trees which enter them, and growing, close the sewer. Other engineers have reported this trouble from the roots of trees, and in the city of Berlin, Germany, it was necessary to relay a considerable amount of sewer, and to prevent further trouble of this kind, the joints were closed with asphalt. Mr. Chase says that trees are out of place on business streets, especially when it is only sixty feet wide. He says a great deal of trouble has come from poplars which are "not only not beautiful, but also damaging to the sewers, curbs and walks. Injudicious and indiscriminate planting of trees is almost as great a sin as indiscriminately cutting them down."

**CHEAP WATER RATES.**—The city of Bradford, Pa., gives very reasonable rates to its citizens for the use of water. The water department has been conducted so well that it has been possible to reduce the rates considerably since 1890. At that time the rates charged for one plain faucet, one wash basin, one hot water boiler, one bath tub and one closet, amounted to \$18 a year. In 1900 this had been reduced to \$5.40 per year. Some of the charges for water service are: Dwellings, first faucet, \$3; each additional faucet, 40 cents; hot water boiler, 40 cents; private bath, 80 cents; closet, \$1.20. The number of meters in the city is very small, there being forty-three, twenty-two of which are of the Pittsburg make. These meters are placed in all large establishments in which there is a great waste of water. It is an indisputable fact that if the city should install the universal system of meters the low rates already given would be greatly reduced.

**MUNICIPAL ACETYLENE PLANTS.**—The installation of acetylene lighting in cities and towns is steadily increasing, especially in those of moderate population, and reports state that wherever this gas has been given a fair trial it has proved very satisfactory and has been extended. In Great Britain the installation of this gas has not been as rapid as in countries on the Continent, but already several places in England and in Ireland are using this method of illumination. The town of Portsoy has given the gas a trial and has the honor of being the first in England to install it. In Italy there are forty towns and villages that are lighted by acetylene, while Germany contains thirty-



eight, running all the way from 382 to 6,000 population. France has twenty-six towns thus illuminated, varying in population from 1,800 to 4,000. United States is not far behind these older countries in adopting this illuminant, for already twenty-five towns and villages, the smallest of which is 4,000 and the largest 9,700, are using acetylene.

**NEW CHARTER FOR ATLANTA.**—The Charter Revision Committee of the city of Atlanta, Ga., has handed in its report of changes and amendments to the old instrument. The new charter contains five chapters which are entirely new, besides dealing with subjects of that of the present time. The new chapters are those on board government, park and forestry, hospitals, electric control, and franchises. In addition there is a portion of a chapter on elections which provides for primaries at the expense of the city. This is new, and is the result of exhaustive study on the subject. The city is divided into five board districts, according to the population and taxable property, and there are to be nine executive boards: boards of water, police, fire, health, electric control, sinking fund, hospitals, parks and forestry, and education commissioners. Any member of a board who shall be absent from two consecutive regular meetings without adequate reason, may be removed by the mayor and a member appointed in his place.

**GARBAGE CREMATORY RULES.**—The rules governing the operation of the garbage crematory in Hamilton, O., have been adopted as follows: The working force will consist of two men, one to be on duty from 6 A. M. to 6 P. M. and the other from 6 P. M. to 6 A. M. The man on duty during the day will receive and burn as much garbage as possible, the night man to finish the burning and remove the ashes and clinkers and clean up. All employees must do their work promptly so that it will be equally distributed. All debris, etc., on the exterior must be cleared away by the man on duty as soon as possible, and at all times the exterior must be kept cleaned up by scrubbing, etc. All garbage must be received that is offered, and dead animals are to be cremated free of charge if the person is a resident of Hamilton. Offal from slaughter houses and butchers is to be cremated free of charge if delivered at the crematory. The cremation of night soil shall be charged for at the rate of twenty cents per barrel. Non-residents of Hamilton will be charged a fee for material incinerated and the money thus charged shall go to the credit of the street fund.

**FAVOR OILED ROADS.**—The use of oil on highways is steadily increasing in favor. In Moline, Ill., oil has been tried in place of water as a remedy for dust and the results have been most satisfactory. Bourbon, Ind., is considering the idea of sprinkling the streets with oil. The dust problem there is a very serious one during the summer months, for there are no gravel beds from which to construct roads. The towns of California, which have been doing more in this line than those of any other state, are testifying to the great benefits derived from oil on the highways, by the continued use they are making of this means of laying the dust. The Board of Supervisors of Sacramento are greatly in favor of oiled roads. Three hundred to three hundred and fifty barrels of oil per mile are at times necessary for the permanent packing of a sand road, but in many cases only one hundred and fifty barrels need be used. The roads of California are, in most cases, of sand and the great benefits derived from the consolidating of this sand with the oil is continually testified to by those in charge of the highways. Not only is the oil a better dust layer and a more permanent one, but it is also more economical than water inasmuch as the roads need to be oiled but once or twice a year while sprinkling with water must be done every little while.

**IMPROVEMENTS IN TAXATION METHODS.**—The taxation methods in Rochester, N. Y., admit of considerable improvement, according to City Clerk Pulver. "Under the present system personal property taxation," says Mr. Pulver, "assessors secure information about the personal property of a certain citizen. His name is placed on the rolls opposite the sum assessable and advertisement is made

that allegations will be heard on all assessments at a certain time. In the case of a man who is assessed for the first time on personal property it is more than likely that he does not know anything about this hearing and consequently he does not appear to have the assessment modified if he wishes to. Consequently the man is considered by the assessors as justly taxable and the assessment is made." Mr. Pulver considers that the fair thing to do would be to notify the citizens who appear on the personal tax list for the first time so that they might have the opportunity of appearing if they wish to. City Comptroller Williams indorses this plan and says that many cases of the character described have come to his notice. He considers that more personal property could be reached by the assessors if a properly worded blank was sent to individuals and corporations to be filled out, describing the extent of their personal property. He is confident that the plan would be more effective than the present one of guessing at the probable value. He describes, for example, the property of a man who was worth over \$500,000 but to whom a tax bill for but \$8 was sent.

**STREET LIGHTING IN WORCESTER.**—The report of Henry A. Knight on street lights, states that the city of Worcester, Mass., is illuminated by 713 arc lights, 479 gas Welsbach, and 1,169 gasoline Welsbach. This is a considerable increase over that of a year ago. The department also has charge of the fire alarm signals. The city made a contract with the Welsbach Street Lighting Company of America by which the company furnishes all the posts, lanterns, burners, twelve mantles per lamp per year, and all other supplies necessary for maintaining the plant, with the exception of gasoline. This last and men are supplied by the city. The city pays 30 cents per night for lights consuming 500 watts, burning 3,900 hours per year. This gives the city a 500 watt lamp for 2.8 cents per lamp hour. The city made a general substitution of gasoline Welsbach for the old open-flame lamps, and the system was completed January, 1901. The superintendent says that the greatest satisfaction has been given by these lamps, and "the efficiency of the light is not affected by wind or storm, and the cost per mile of street lighted by this system is little in excess of that paid for the uncertain open-flame lamp." The city pays for the gas Welsbach \$29.82 per year, and for the gasoline \$23.13. Notwithstanding its size, the city depends upon the moon to light the streets during a portion of the month, and the superintendent characterizes this as an absurd method of procedure, inasmuch as the moon does not always favor them with its presence.

**MODERN GARBAGE SYSTEM FOR NEWARK.**—The Board of Works has adopted specifications for collecting the garbage of Newark, N. J., which will divide the city into two districts according to the estimated amount of material to be collected. From November first to May first in the more populated district, ashes will be collected every day except Sunday, and garbage three times a week. During the rest of the year the garbage will be collected every day and the ashes three times a week. Once a week waste paper is to be collected all the year round. In the outlying districts the ashes will be collected four days a week during the winter and garbage two days, while during the rest of the year ashes will be collected two days a week and garbage four days. The ordinance includes a fine for residents who fail to provide proper receptacles for refuse, or fail to separate them as directed. The garbage must be placed in covered receptacles that are water tight. Receptacles for garbage, ashes, or waste paper, must be placed on the curb just before the time of collection. The contractor must provide wagons of metal and they must be disinfected thoroughly from time to time. The garbage is to be treated or consumed in a proper sanitary way under the supervision of the Board of Works or the Board of Health, and must be entirely destroyed within twenty-four hours of the collection. Waste paper is to be destroyed, but ashes may be dumped at convenient places. The contract is to run for five years and monthly reports to be made by the contractor, showing the number of loads of ashes removed and the gross weight of the garbage. A bond of \$50,000 is required for the faithful performance of the terms of contract.

### The New New York

FIRST in significance among the changes now making or soon to be wrought in Manhattan must be put the actual and projected railway tunnels, the East River bridges holding a good second place. Next to these comes the erection of such magnificent buildings as the Episcopal cathedral, the Public Library, and its many branches, the proposed Post Office and the Custom House, the Chamber of Commerce and the Stock Exchange. The municipality's contribution to the growing greatness of the city is not restricted to the building of bridges, but includes the Zoological Park and Botanical Garden, sites and buildings, bridgeways and viaducts, parks and parkways, improved school and fire-houses, recreation piers and piers for commercial purposes, free baths, public comfort-stations, and smooth street pavements. Private initiative provides new university and college buildings, churches, club-houses and theatres, hotels, apartment houses, and private dwellings, and office buildings that rival the tower of Babel not only in height but in the linguistic diversity of their occupants. This lavish expenditure of wealth and energy, both collective and individual, must result within a very few years in the creation of a virtually new New York. And if we succeed in retaining an enlightened local government, and the admonitions of the Municipal Art Society and the Municipal Art Commission are duly heeded, the proposed tricentennial celebration of the discovery of the Hudson River will find us in 1909 prouder than we have ever had reason to be of the magnificent city that in three centuries has been reared on Manhattan Island.—*The Century Magazine*.

### Park and Outdoor Art Association

AMONG the various organizations which have sprung up during the past few years to promote the interests of the modern city, none has undertaken a more difficult or thankless task than that espoused by The American Park and Outdoor Art Association. The chief object of this society is to create "the city beautiful."

The sixth annual meeting of this society will be held in Boston, August 5, 6, and 7. The first addresses will be given in the afternoon of the first day. There will be one by Dr. Charles W. Eliot, President of Harvard University, on "The Public Utilization of Public Reservations;" another by Rev. J. N. Hallock, D. D., New York City, Editor of *The Christian Work*, on "The Influences of Beautiful Surroundings on Children." The principal speakers for the evening are Miss Myra Lloyd Dock, of Harrisburg, Pa., member of the Pennsylvania Forestry Commission, on "State Forest Reservations;" Dick J. Crosby, of the Department of Agriculture, Washington, D. C., on "The School Garden Movement."

At the morning session of the second day an "Experience Meeting" will be held, at which brief addresses, outlining the work of the various national associations engaged in civic improvement effort, will be given. Among those to be represented are: The American Society of Municipal Improvement, by Edwin A. Fisher, C. E., President; The American Institute of Architects, by Frank M. Day, Vice-President; The Architectural League of America, by H. K. Bush-Brown, Chairman of the Municipal Improvement Committee. In the afternoon two meetings will be held, one under the auspices of the Woman's Auxiliary, and the other for the interest of park commissioners. In the evening an address will be given by the Hon. John De Witt Warner, President of the Commission of the City of New York, and of the Municipal Art Society, on "Civic Improvement Progress," and another address on "The Forward Movement in Harrisburg," by J. Horace MacFarland, Secretary Executive Committee of the Harrisburg League for Civic Improvements.

In the morning and afternoon of the third day, parallel sessions of the Woman's Auxiliary and the regular association will be held. The principal addresses in the evening will be given by Hon. Clinton Rogers Woodruff, of Philadelphia, on "Public Beauty and Good City Government;" and by Sylvester Baxter, of Boston, on "The Relations of Parks to City Plans."

A unique feature of this convention will be the exhibitions connected with it, all of which will be given in the Convention Hall. There will be an exhibition of maps and photographs of parks and of landscape design, another with photographs and drawings of school gardens, another of designs for artistic bill-boards, another of the current literature of outdoor art and civic improvement.

### A Strong Plea for Water Meters

For many months there has been a contention between the Water Works Company and the city officials of San Antonio, Texas. Many ineffective efforts were made to adjust the differences between them. As a last resort it was determined to employ a consulting engineer to review the entire situation, and, if possible draft a plan upon which both parties could agree. Mr. Chester B. Davis, Consulting Engineer, of New York City, was selected to be the arbitrator.

Mr. Davis has made the most thorough investigation and submitted his report, which makes a pamphlet of some eighty pages. He states the case in a judicial way, graphically describes local conditions, points out the defects of the water system now in use, suggests needed improvements, and also gives good reasons why some of the demands of the city are unjust. Happily for all concerned, Mr. Davis has proven himself an efficient arbitrator. His report was adopted and its terms agreed to without a dissenting voice.

According to Mr. Davis, the city is now wasting over 5,000,000 gallons of water a day. This needless waste is ascribed to a lax inspection of service pipes and the non-use of meters. The chief cause of the water waste, in his opinion, is due to the non-use of meters. The argument which he advances is such a strong one and so well put, that we quote it, as follows:

"The evils due to wasting water, and the proper remedies therefor, constitute the hardest problem coming before municipal and company water works managers.

"Where the character and intelligence of the community enables it to co-operate with the management, the result is comparatively easy.

"Where it is otherwise positive measures must be used.

"In both cases the result is the use of meters to a greater or less extent. Water costs money, as also do meat, flour, potatoes, fuel and the like, and if it is just to the seller and not unjust to the buyer for any one of these commodities to be measured or weighed to determine its equivalent in money, then it is alike fair that every one of them or all, may be measured or weighed to determine its equivalent in money, and it is as senseless and foolish that a grocer should accept \$25.00 a month for all the groceries a family may take home to use, waste and distribute among its neighbors as to accept eight dollars for the water one family may use, waste and distribute during one year. There is actually no difference in effect. That water has been sold in this manner is due to the fact that its sale commenced a long time ago when there were no reliable meters for measuring its continuous or intermittent flow, and of recording such accurately.

"Many forms of water meters do this accurately, and only two reasons now remain where clear water is supplied where all water services are not supplied with them.

"One is that, the management finds it inexpedient, or not advisable, to meter small consumers who do not waste much water, believing where water is abundant that the extra loss of money is nearly off-set, or is inconsiderable, because the installation, care of and the reading of the meters adds somewhat to the operating expenses.

"The other is that the consumers are generally entirely misinformed of the true function of and service rendered by the meter, and their prejudices and their influence in the aggregate are such as to prevent their use.

"Their prejudices prompt them to feel that the use of the meter deprives them of their privilege of using all the water they need, and tends to make it more expensive.

"Nothing could be farther from the truth and from actual experience. It does tend to check him if he has been wasting and makes his bills larger if he continues to waste, just as his butcher makes him pay more money if he carries away or wastes more meat, but his bills are nearly uniform, if he always uses only what his needs require.

"Each 1,000 gallons of water costs a certain amount of money, depending entirely upon local conditions. When it is taken from the faucet why should one not pay a reasonable price for it, and why should one expect to take 2,000 gallons and pay for only 1,000 gallons if he be fair and honest? If one thinks, he must appreciate that his neighbor must help pay the cost of the extra 1,000 gallons, or that he must help pay for his neighbor's 1,000 gallons wasted.



"The city has the power to regulate the rates charged for water, and does, so the charge to him is fair. The consumer regulates the volume he uses or wastes, or both; hence it is fair that he pay for all. The use of a meter is the best method known for determining this volume; then why is it not fair to use a meter?"

"If it is unfair to insist that a meter be used, or is wrong in any sense, then it is equally unfair and wrong that the dealer use the yard stick, the scales and the measure. This conclusion is legitimate and there is no fair escape from it.

"The man who is opposed to using a meter says he fears it will cheat him. If he use one of a reliable make he will find it is accurate to within one (1) per cent., and this error is against the company. The contract gives him a method of determining from time to time if it is accurate.

"To object to the use of a meter is substantially to prefer the methods of antiquity and to oppose modern methods which years of study and experiment have developed, and which indicate an advance in civilization an intelligence."

### "Isles of Safety"

SOME weeks ago The Municipal Art Society, of New York, invited competition for a design for an electrolier to be combined with an "Isle of Safety," to be placed at the intersection of Fifth avenue and the south side of Twenty-third street. It was the announced object of the Society to present the electrolier, when completed, to the city.



FIRST PRIZE

It was desired to obtain a simple and beautiful street fixture, to serve as an example for future work; by its placing to divide the traffic so as to force it to follow the rules of the road and keep to the right; to supply a place of safety for foot passengers in crossing the avenue; and to give a place for the necessary lighting, signs, etc., for the convenience of the public.

One of the conditions of the competition required designs which should not call for an expenditure of more than \$1,500 for the final and complete execution of the electrolier. The first prize consisted of a commission to execute the necessary full size drawings and such modelled details as are required for the execution of the proposed work, for which \$500 will be paid. The second prize consists of \$100, and the third prize, \$50. The jury which reviewed and passed upon the work of the competitors, all of whom are members of the Municipal Art Society, consisted of the following persons: Jacob A. Cantor, President of the

Borough of Manhattan; Frederick Crowninshield, President of the Fine Arts Federation; John De Witt Warner, President of the Municipal Art Society; William T. Evans, F. Wellington Ruckstuhl, Frederick Stymetz Lamb, F. Benedict Herzog, Nelson S. Spencer, George E. Bissell, A. D. F. Hamlin, William Laurel Harris, H. A. MacNeil, George B. Post, Bruce Price, Charles M. Shean.

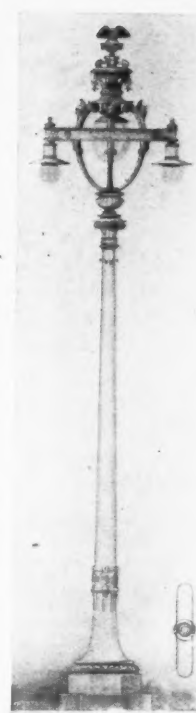
The first prize was awarded to Mr. Victor A. Ciani, 3 West 15th street, New York City; the second prize, to Mr. Henrik Wallin, 32 Liberty street, New York City; the third prize to Wilkinson & Magonigle, 156 Fifth avenue, New York City, and Honorable Mention was given to a design submitted by Mrs. Edith Woodman Burroughs, 207 Franklin place, Flushing, L. I.

In referring to the project and its desirability, Mr. Frederick S. Lamb, Secretary, Municipal Art Society, said:

"The idea of the 'Isle of Safety' is to divide traffic so that there may be established

in this country the custom existing in cities of the Old World of keeping to the right of the road. The safety of foot passengers is greatly increased by the introduction of the 'Isle of Safety' in cities. It is, moreover, the object of the society, while studying the utilitarian necessities of the city, at the same time, to introduce a public fixture which will be an object of beauty and admiration.

"The Isle of Safety" already exists in a rudimentary form in this city. When West street was widened it was soon discovered that the lives of foot passengers were endangered by reckless driving. It became necessary to provide some means of safety, and temporary "Isles of Safety" were introduced, as, for example, at the Erie Railway Station, at the foot of Chambers street. There, wooden "Isles of Safety" with the necessary guard rails to prevent the trucks from encroaching, have been fastened to the asphalt, and in congested hours are a source of great convenience to the travelling public. The "Isles of Safety" introduced in the avenues and uptown sections of the city would of necessity, be long and narrow, in order of the Society to present the electrolier, when completed, to the city. of what is intended may be obtained any day in the late afternoon by going to Twenty-third street and Fifth avenue, where one may see a policeman in the middle of the street dividing the traffic to the right and left and acting as a human "Isle of Safety" for the foot passengers who desire to cross. Other congested points under consideration by the Society are at Fourteenth street and Fifth avenue and Forty-second street and Fifth avenue and Thirty-fourth street and Fifth avenue. It is thought that if such a scheme as is proposed by the Municipal Art Society should prove successful, it would be possible, as traffic congested, to carry the system to the minor streets. "Isles of Safety" have been in use in Europe for the last twenty years, in Paris, Vienna, Budapest—in fact, in all Continental cities of importance."



THIRD PRIZE

### Water Statistics of Ohian Towns

	Population.	Per capita cost works.	Miles of mains.	No. services in use.	No. meters in use.	Daily consumption per service.	Daily consumption per capita.
Batavia .....	1,029	\$21.41	3.5	26	0	....	...
Bellevue .....	6,649	21.06	17.0	900	18	714	94
Blanchester .....	1,788	20.14	11.0	70	10	214	9
Dayton .....	85,333	15.98	117.9	9,500	5,631	537	60
Eaton .....	3,155	25.35	8.7	407	168	144	19
Franklin .....	2,724	20.95	8.0	340	24	882	110
Greenville .....	5,501	18.36	13.0	450	257	484	40
Hamilton .....	23,914	15.27	40.0	3,195	827	569	76
Lebanon .....	2,867	18.14	10.0	430	12	244	37
Lynchburg .....	907	13.23	3.5	94	0	266	28
Madisonville .....	3,140	11.14	9.0	138	1	800	35
Middletown .....	9,215	11.94	18.0	995	62	904	98
Norwood .....	3,240	23.79	35.0	874	140	....	....
Osborn .....	948	22.05	3.0	97	0	....	....
Oxford .....	2,000	22.40	7.0	211	9	142	15
Piqua .....	12,172	32.02	24.5	1,320	0	1,130	123
Sidney .....	5,688	27.69	14.5	700	24	913	112
Springfield .....	38,253	17.65	54.0	4,040	200	760	80
Tippicanoe .....	1,703	11.74	6.0	267	0	281	44
Trotwood .....	214	14.48	0.4	22	0	....	....
Troy .....	5,881	21.25	14.0	994	78	506	86
Urbana .....	6,808	24.24	20.0	910	50	1,286	186
W. Alexandria .....	740	....	2.5	91	91	385	47
W. Carrollton .....	987	8.00	2.5	84	0	....	....
Xenia .....	8,696	23.00	20.0	670	50	522	42

Trotwood, Urbana and Xenia have private plants, and Blanchester has both a public and private plant.

—Do not forget that the Pere Marquette is the most direct road between Detroit and Grand Rapids, where the next meeting of the League of American Municipalities is to be held.



SECOND PRIZE

### Steam from London Refuse

It is the general rule in Europe that nothing should go to waste from which any possible good can be realized. The immense amount of refuse that a city of the size of London produces presents a problem of disposal that must be met in some way or other. Instead of dumping it into the sea or waste lands, the refuse destructor has gradually come into use, and not only is the refuse destroyed in these furnaces but power is obtained from the heat they generate. At Gray's Thurrock is a combined refuse destructor and electric generating works. In the electric station are two steam sets of 100 kilowatts at about 500 volts, a booster, and a storage battery. In the boiler room are two 30-foot Lancashire boilers adapted for coal firing. These are only used when there is an insufficient supply of refuse.

After the gases leave the furnaces they pass through a combustion chamber in which most of the dust settles, and then through the boiler flues and regenerator into the chimney. The normal capacity of each furnace is one ton per hour, but this can be doubled in case of necessity. As this plant is in operation only six or seven hours a day the best work of course cannot be done. Although the fires are out some seventeen or eighteen hours, within an hour of starting up the generating plant was charging accumulators at its full capacity.

The maximum load on the station is eighty kilowatts and this is easily maintained by the consumption of two tons of refuse an hour. As only two stokers and a trimmer are employed this averages one ton per hour for each stoker, which is very easy firing. The maximum output in kilo-watt hours per ton average 35. If the plant were run continuously the great amount of heat that is lost in bringing the boilers and surrounding brick work to the proper temperature would be saved and the efficiency of the plant greatly increased. No smoke or dust comes from the chimney nor is there any odor in its vicinity.

### Chicago's Municipal Lodging House

A BRIEF review of the methods in vogue at the Municipal Lodging House in Chicago is interesting from the fact that its success has been most marked since its inauguration. The short time it has been in operation shows in the greatly lessened number of beggars on the streets. The municipal lodging house was first opened to the public a few days before Christmas day last year. By the end of April over 75,000 men had passed through the institution.

Every man who comes to the city, if he has no money, is welcome in the lodging house. He is required to answer a searching series of questions, in the course of which he is forced to give the names of the last three places in which he worked, even though there might be an interval of years. He is then compelled to take a bath, and after his bath is examined by the city physician or one of his assistants. All these data are set forth in a card specially printed for the purpose.

After his bath and his medical examination the man is given his supper and a clean bed, a bed as immaculately clean and white as a hospital cot. In the morning every man is called early. If it is his first night he is required to go on the street gang for three hours and is given the rest of the day in which to look for work. If he does not get work he is entitled to return to the lodging house for that evening, and is given food and lodging again.

His work on the street gang has been noted, however, and the foreman of the gang makes a report on every man who has been sent from the institution. If the tramp has not worked well, he is sent back again to the gang, but if he has worked well he is given employment with one of the many firms in the city which have agreed to take men from the municipal lodging house. No man is put on the street gang, however, if he can get other work.

Those who cannot work, through weakness, are kept at the lodging house a few days making beds. If the doctor finds that their constitutions are so badly ruined that they are no longer fit for any kind of work, the men are either sent back into the country where they belong to get poorhouse relief, or else they are taken care of by one of the city charities.

The effect of this has been to drive away from the house every professional tramp and all who are too drunk to keep a job. Men who are really looking for work are welcome.

### Specifications for Oil Macadam

"The progressive town of Emeryville, Cal., has adopted specifications for macadamizing streets which requires the use of crude oil in the construction," says *California Municipalities*. Engineer Thomas N. Badger, who prepared the specifications, reports that two miles of street of oil macadam will be laid by the town trustees. Engineer Badger considers that the most satisfactory results following the application of crude oil to macadam would be saved by its use at the time the street was first constructed. His specifications are: All macadamizing shall be done only with hard rock of igneous character, known as hard blue trap rock or hard gray trap rock, which shall lose by abrasion and fracture not more than 20 per cent. of its original weight when subjected to the Rattler test, which test shall consist in placing 125 pounds of the macadamizing rock, crushed to pieces through a two and one-half inch circular ring, in the machine known as the "rattler" and revolving at the rate of twenty-eight revolutions per minute as nearly as practical for 5,000 revolutions.

After the grading and rolling of the street to the proper subgrade, as prescribed heretofore, a layer of rock eight inches in thickness, crushed to pieces through a two and one-half inch ring, shall be spread evenly over the street, which will then be rolled with a roller and made to conform to the section hereto attached and made a part hereof, after which a layer of one inch screenings shall be applied to the entire street surface. The whole is then to be well watered and thoroughly rolled with a roller of not less than ten tons in weight.

After watering and rolling it shall be allowed to stand undisturbed for a period of twenty-four hours, when it shall be coated with crude mineral oil of twelve to fourteen gravity Beaume, containing not more than 2 per cent. of water. The oil shall be applied at a temperature of 200 degrees Fahr.; the roadway shall be dry and the sun shining at the time of its application and the ratio of application shall be one gallon of oil to one square yard of street surface.

The application of oil shall be immediately followed by a layer of sand one-half inch in thickness, to be evenly spread over the entire oil surface. Great care shall be exercised to prevent the application of oil to the cross walks, and one side of the street shall be completed before commencing work on the other.

### Baths in Lyons

IN the city of Lyons, France, there are many bathing establishments on the Rhone and Saone, in which one may bathe for the sum of six cents. For four cents additional a bathing suit and towels can be obtained.

In 1898 a company was granted a concession to build small bathing houses on the public squares of the city, eight of which are now in operation. They are constructed of porcelain, 20 feet long by 14½ feet wide and 12 feet high. Within are six stalls, each of which is divided into two apartments by a waterproof curtain, on one side of which is a dressing room containing mirror, comb, brush, clothes-rack, chair, etc. On the other is an electric bell, soap and wash-stand and warm and cold water, shower bath, etc. Each bather is entitled to about ten gallons of hot water with an unlimited supply of cold. During the winter the stalls are heated. Under the bathing house is a cellar containing the boilers which supply the heat and pump the water. The price of shower bath in these places, as fixed by the act authorizing them at 3 cents, includes towels and soap. No tips are to be given or accepted by the matron in charge. The act also specifies the size of the towels to be supplied. They must be at least 31½ inches long by 19¾ inches wide, and the rules require that after each towel has been used it must be disinfected.

The company running the bath houses receives a subsidy of \$3,860 per year from the city and the free use of the ground for a period of thirty years. After that time the establishments are to become the property of the municipality. Provision is inserted, however, that if at the end of ten years the number of persons using the baths in the city is less than two hundred per day, the experiment is to be considered a failure and the city will have the right to cancel the contract after six months' notice to the company.



### Use of Wide Tires Obligatory

THE legislature of the State of Massachusetts in 1900 passed an Act to regulate the width of tires on draft wagons which was to take effect January 1, 1902. That law is now in force and it is one which should be widely copied by other states. It provides that,

"On and after the first day of January in the year 1902, it shall be unlawful, except as provided in section four of this act, to use upon any road, street or way in this Commonwealth, a draft wagon or cart having tires of iron or steel, or of any substance equally hard, which are less in width than one and one-half times the diameter of the axle measured at the shoulder thereof; but in no case shall a tire more than four inches in width be required, and wagons or carts built with wooden or hollow axles shall have tires not less in width than the diameter of the axle measured at the shoulder thereof.

"This act shall apply to all wagons and carts, the axles of which are two inches or more in diameter, measured as aforesaid, and to all stage coaches, tally-ho coaches, barges, and other passenger vehicles, not built to run on iron or steel rails, and constructed to carry eight or more persons.

"Whoever violates any provision of this act shall be punished by a fine not exceeding one hundred dollars."

### Uniform Accounting in Iowa

THE League of Iowa Municipalities appointed a committee to investigate the matter of a system of accounting that should be used in all cities in the state. The committee reported that a law should be passed providing for a uniform system of accounting for receipts and expenditures of cities and that information in relation to it should be generally disseminated. This would provide a practical way for each voter to learn about the fiscal affairs of his town as compared with those of other cities. A thorough system of public accounting would insure a more economical administration and prevent the misappropriation of funds. Now invariably a Council leaves to its successors an increased indebtedness and confusion in accounts, and a uniform accounting system would prevent any such cases. The report of the committee cites the case of the municipal management of the gas works tried by the city of Philadelphia and its resulting failure, due to bad accounting. The great taxation in cities and towns would be remedied by the publicity given through uniform systematic accounting. As the cities of Iowa are still comparatively young it is time yet to lay the foundation for the best government in the future. The committee recommends, therefore, a bill entitled "A Bill for an Act Requiring the Keeping of Accounts for Cities," and requiring that publicity be given thereto.

### New Charter for Terre Haute

THE city of Terre Haute Ind., is to have a new charter, which will go into effect Sept. 1, 1902. The executive and administrative authority of the city will be vested in the mayor, city clerk and several departments. The mayor and city clerk will be elected for two years, the mayor to have a salary of \$2,000 and the city clerk one of \$1,800. The city clerk will act as clerk to the council and may appoint a deputy to assist him at his own expense, but the council may authorize him to employ a deputy at a salary of \$800, to be paid by the city. The mayor will have the power to appoint the heads of departments and may at any time suspend or remove from office any and all persons appointed by him or his predecessors provided he notify them and give his reason in a message to the council. As often as he deems necessary he shall have the power to appoint three persons to examine, without notice, accounts of any department, officer or employee. The following departments are established under the charter: finance, law, public works, public safety, assessments and collection, public health and charities. The city comptroller will be the head of the department of finance at a salary of \$1,200, which may be increased by an ordinance to \$1,800 in case the office is not combined with that of the clerk, as at present. A deputy may be provided for by the council with a salary not to exceed \$1,000.

The head of the department of law is to receive a salary of \$1,500 with a limit of \$2,000 in full for all services. All fees or emoluments collected by him shall be turned over to the city treasurer.

At the head of the department of public works will be a board of

three members appointed by the mayor, not more than two of which shall be of the same political party. Each member will receive \$1,200 a year, to be increased to not more than \$1,500 and must give a bond for \$5,000. The mayor is to appoint a city civil engineer at a salary of \$1,500 a year.

The department of public safety is to be under charge of three commissioners appointed by the mayor, not more than two to be of the same party, and they are to have charge of the fire and police. To these offices are attached salaries of \$400 a year. Commissioners are to appoint a superintendent of police, chief of fire department, and all other members of each force.

The office of city treasurer is to be abolished and the treasurer of the county will perform the duties of the former city officer. For those duties which fall upon the county auditor he is to receive a salary of \$300 a year, and the county treasurer is to have \$500 in full, but the council may allow a percentage for collecting taxes.

The department of health and charities is also to be under three commissioners, who are to be practicing physicians, appointed by the mayor, at a salary of not more than \$150 per year. One of the number shall serve as registrar of vital statistics and receive \$100 additional.

The judicial power of the city is to be vested in a city court. The police judge is to be appointed by the mayor at a salary of \$1,000 and give a bond of \$5,000. He shall also act as clerk of his court.

Members of the council are to receive a salary of \$160 a year. In case of a vacancy in office of mayor the city comptroller shall act as mayor, drawing the latter's salary, but performing no duties as comptroller until a successor is elected at a special election. One councilman is to be elected every two years from each ward and three councilmen at large. The removal of a councilman from his ward will vacate his office.

No member of the council, officer, clerk or employee of the city shall directly or indirectly be a party to, or in any manner interested in, any contract or agreement with the city for any purpose whatsoever. No officer, employee, or servant of any corporation holding a franchise of the city or having a contract with the city shall be eligible to hold any office under the city. No councilman, or other officer or employee of the city shall purchase directly or indirectly any bond, order, claim or demand against the city for any sum less than the amount specified thereon, and any bond, etc. so purchased shall be forfeited to the city and no action shall ever be maintained thereon.

When it is provided that an ordinance shall be passed by a two-thirds vote it is meant two-thirds of the members elected. No ordinance shall be passed at the same meeting introduced except by the unanimous consent of at least two-thirds of the members present. The mayor shall return bills within ten days, accompanied by approval or disapproval. If not signed the council may pass the bill over the veto within thirty days by a majority vote of the members elected. One of the powers of the council shall be the right to prevent encroachments on the shores of streams and injuries to water supply for a distance of ten miles from the city. Within a limit of four miles they shall have the power to regulate the location of all manufacturing establishments, stables, etc., whose business may affect the public health. It has a jurisdiction of four miles for the purpose of regulating the deposit and removing of garbage, etc. and for quarantine regulations. To the council is given the power to license, tax, regulate and prohibit the supply and distribution of artificial and natural gas, to fix the price thereof and to compel by ordinance the extension of mains, pipes, electric lines and the supply of gas, water and electricity. It has the power to license, tax, regulate and prohibit the sale of malt, vinous and spirituous liquors, and regulate and tax places where these are sold, stored or manufactured. For above purposes the jurisdiction of four miles from the corporate city is given. The same limits apply to the preservation of peace and good order and the suppression of gambling and immoral resorts.

The executive and administrative functions are to be performed by the proper executive department and not by the council. No new department shall be created. In case the council fails to assign any work to a department the mayor shall assign it.

The common council has the power to levy an annual tax of not more than \$1.25 on every \$100, and to borrow money not exceeding 2 per cent. of the taxable property.

# MUNICIPAL LIGHTING STATISTICS

Including Seventy-six Cities in the United States and Five in Canada

CITY.	Total cost.	Total indebtedness.	Operating expenses per year.	Arcs.		Incandescent.		Cost per year.			Cost to consumers.	Cost fuel per ton.	Plant began.	
				Street No.	Hours burn.	Commercial No.	No. street.	No. private.	Street arcs.	Street incand.				Arc.
Ashtabula, O. ....	\$80,000		\$15,000	115b	↑	50b	6(4)	8,000(1)			\$5.00 mo.	\$.10 K	\$1.90	1889
Bainbridge, O. ....	13,000	\$8,000	1,800	30	2,000			800	\$60.00			.08 M	1.75	1899
Barnesville, Ia. ....	28,000	41,000	4,500	37b	↑		3(3)	2,000	50.00			.12 M		1896
Bellevue, Ia. ....	20,000	5,000	2,530		↑	8	30(4)	3,000	52.80	\$12.00	5.00 mo.	.12 K	\$3.00	1896
Blanchester, O. ....	43,000	43,000	4,000	32	1,200			3,000	60.00	12.00	3.00 mo.	.10 K	2.60	1896
Blue Earth City, Minn.	53,000	3,000	4,500	13a	↑	9a	65(2)	2,500(1)	d 40.00	11.00	.10 K	.10 K	3.75	1889
Caldwell, O. ....	8,000	7,000	2,000	b	1,000			5(4)	56.00			.15	4.00	1898
Casselton, N. D. ....	6,500			16b		4a	2(3)	683				.10 K		1897
Chambersburg, Pa. ....	45,000	23,000	13,000	92b	A. N.	72b	22(3)	4,000(1)	70.00	12.00		.10 M	2.80	1890
Chardon, O. ....		5,000	3,750	31b		1a		1,600	d 39.50				1.85	1897
Charleroi, Mich. ....	16,000	10,000	8,000	17b		3c	4(3)		50.00					1883
Chicopee, Mass. ....	108,347	102,000	13,921	151a	3,167	19a			68.20			.118 K	4.57	1896
Clarion, Ia. ....		6,000					100(3)	800(3)		7.00				
Coldwater, Mich. ....		70,000	10,500	79b	1,700↑	50b	13	7,000	60.00		3.00 mo.	.105 K	2.71	1891
Columbus, Ind. ....	47,000		3,653	82b	2,590				57.00					1890
Detroit, Mich. ....	828,088		90,987	2,067b	3,716			100(5)	61.76				2.05	1895
Dexter, Mo. ....	12,000		1,800		↑		50(1)	750				.01 hr.	†	1896
Esterville, Ia. ....		12,000	5,000	45b	↑			4,000				.10 K	2.60	1897
East St. Louis, Ill. ....		350	700	35b	↑		19(3)	350(1)		20.00	5.00 mo.	.40 mo.		1897
Elgin, Ill. ....			12,868	215b	2,236	17c		2,000	43.09		4.00 mo.	.10 M	2.70	1889
Evart, Mich. ....	7,000	4,000	2,000	16a	↑	1a		2,000(1,3)	d 25.00		.05 M	.05 M	\$1.50	1895
Fayette, Mo. ....	18,000	11,000	2,500	35b		10b		1,000(1)			5.00 mo.	.005	2.00	1893
Fitzgerald, Ga. ....	33,000	33,000	3,600	27a	↑	4b		600			5.00 mo.	1.00 (1)	\$1.25	1899
Flushing, Mich. ....	35,000		3,000	20b	↑		15(1)	3,500	60.00			.06 hr.		1895
Fort Worth, Tex. ....	52,000		6,111	114a	2,281↑		568(2)		65.00	8.07			2.55	1890
Fredonia, N. Y. ....	16,000				b				d 35.36				2.20	1890
Fulda, Minn. ....	5,000	500	1,980	11b	↑			300			6.00 mo.	.50 mo.	3.60	
Galion, O. ....		26,000		103b	2,547	40b		2,000			5.00 mo.	.10 M	2.12	1889
Gladstone, Mich. ....	12,000		5,075	24b	↑		10(3)	1,800(1)	40.00	8.00		.12 M	2.80	1897
Goshen, Ind. ....	20,000			125b	↑			3,200(1)	36.00			.06	2.65	1889
Groton, N. Y. ....	11,856	11,000	2,400	36a	1,800		6(4)	800(1)				.066 M	2.60	1896
Hannibal, Mo. ....	70,000	30,000	12,000	100b	5,000	50b		25,000(1)	d 15.00		5.00 mo.	.012 K	1.10	1888
Hamilton, N. Y. ....	80,000	74,000	6,000	60a	A. N.↑			5,000				.015 p.	3.45	1895
Healdsburg, Cal. ....	85,037	76,000	4,651	31a	4,750	1a	10(3)	2,650(1)	87.00	12.00				1900
Henderson, Ky. ....	38,000		7,500	168b	3,280	50b			d 48.00			.05 K	1.25	1896
Herkimer, N. Y. ....	41,500	27,000	7,296	75b	3,344	2a	3(4)	6,000(1)	76.22				2.60	1891
Hingham, Mass. ....	19,002	18,000	11,164	5a	↑		392(3)	2(3)	64.00	15.00		.20 K		1894
Holden, Mo. ....	12,000	10,000	4,500	33b		3	15	7(4)			5.00 mo.	.15 K		1897
Holly Springs, Miss. ....	68,000	59,000	6,000	28	2,200			2,000(1)	48.00			.15 K	2.10	1898
Hope, Ark. ....				20b				500					\$1.50	
Hudson, N. Y. ....	31,750	36,000	8,588	25b	1,600	18		4,000(1)	100.00	18.00		.20 K	4.00	1897
Jacksonville, Fla. ....	166,649	75,000	41,179	164b	3,700	100b	300(3)		79.48	22.00	7.50 mo.	.07 K	\$2.50	1895
Jacksonville, Ill. ....	24,000		8,000	183	2,700								1.54	1895
Jamestown, N. Y. ....	80,423	62,000	10,830	298a	3,533	65	14(3)	2,800(1)	36.36		3.00 mo.	.10 M	2.00	1890
Lakewood, O. ....	35,000			104b	3,250	15b		3,500	60.00			.10 K	2.00	1897
Lansing, Mich. ....		60,000		146b	A. N.	130	30(3)	250	75.00			.08 K	2.45	1892
Leseur, Minn. ....	30,000	20,000	3,000			1a	65(3)	1,850(1)				.10 M	3.75	1896
Linton, Ind. ....	11,000			30b	↑	10b		1,200				.08 K	.55	1901
Marshall, Mich. ....	50,000	24,000		84b	↑	30b		3,800	30.00		3.00 mo.		W	1893
Mattoon, Ill. ....	20,000		4,200	123b	2,300				52.00				.85	1892
Mazomanie, Wis. ....	12,000	9,000	1,800				55(3)	300(1)		12.00		.11 K	\$3.75	1894
Middleton, Del. ....				2a	3,650	7a	90(2)	1,500(2)					3.20	1893
Milford, Del. ....	43,000	43,000		4b	3,650		100(1)	1,850					4.70	1897
Mishawaka, Ind. ....	35,000	13,466	6,429	76b	↑	15		3,000	40.00			.11 K	2.30	1895
Muncie, Ind. ....	29,000	22,000	5,000	167b	2,600				46.00					1892
New Richmond, O. ....	30,000	29,000	3,000	40c	↑		6(1)	1,600	d 40.00			.07 K	1.68	1899
Newton, Ind. ....	25,000	14,000	5,600	9a	↑	85a	188(1)	5,250				.10 M	1.35	1891
Newton, Mass. ....	20,000	7,500	4,500	42b	750			1,200(1)				.10 K	1.60	1894
Niles, Mich. ....	45,505	40,000	4,500	78b	A. N.↑	25b		4,500(1)	60.00		3.25 mo.	.08 M	W	1894
Oxford, O. ....	45,000		5,000	41b			14(4)	3,000(1)				.006 p.	2.65	1880
Painesville, O. ....	16,500	3,000	4,000	97b	1,900				50.00				2.15	1888
Paris, Ill. ....				100a	2,900				50.00				2.20	
Pawpaw, Mich. ....	25,000	9,000	1,500	32b		27a		2,000(1)	40.00		2.50 mo.	.005 p.	W	1893
Peapody, Mass. ....					A. N.				75.00			.13 K	4.00	1892
Peru, Ill. ....	27,000				A. N.		210(1)	4,000					1.15	1888
Port Arthur, Tex. ....	13,700	15,000	936		↑		80(4)	1,300(1)					\$3.00	1897
Portland, Ind. ....	19,000	9,000	4,750	65b	↑	15b		2,200(1)	d 24 67		4.00		↑	1894
St. Charles, Ill. ....	35,000	4,000	10,000		A. N.		263(3)	1,200				.10 M	2.25	1890
St. Clair, Pa. ....	26,500	26,500	5,500	29b	A. N.↑		8(3)	1,565(1)	60.00			.25 (1)	1.25	1894
St. Johns, Mich. ....	45,000	30,000	3,000	a	1,000	a	8(1)	2,500(2)	72.00	48.00	6.00	.12 M		1894
South Haven, Mich. ....	50,000	30,000	9,000	13a	↑		90(3)	5,000	50.00	10.00		.10 K	3.28	1895
South Norwalk, Conn. ....	64,580	58,275	27,497	103b	2,618			3,540(1)	56.00			.05 K	2.88	1892
Spencer, Ia. ....	18,000	16,000		10a		13b		3,200	57.50		4.50		2.00	1891
Spirit Lake, Ia. ....	16,000	500	3,000	b	↑	a		1,000	50.00		4.50	.17 K	2.20	1894
Union City, Mich. ....	38,000		4,500	45b		20b		1,500	40.00		45.00 yr.	.10 M	2.70	1895
Wallingford, Conn. ....	52,000	55,000	11,126	89a		10a	7(5)	5,400	48.69			.10 K	4.20	1900
Fort William, Ont. ....	37,516	39,000	10,554	35b	1,672	10a		3,500(1)	60.00				2.60	1898
Huntsville, Ont. ....		3,000			↑		22(4)	1,300(1)				.25 mo.	\$2.50	1898
Joliet, Que. ....	75,000	75,000	3,500	34a	↑		30(3)	2,000(1)	30.00	4.00				1889
Kincardine, Ont. ....				20b	A. N.		10(3)	1,200	50.00	5.00			3.00	
Picton, Ont. ....	45,000		4,000	66a			3(3)	3,000(1)	30.00				3.75	1889

a, 1,200 candle power; b, 2,000 candle-power; c, 1,600 candle-power; † moonlight schedule; (1), 16 candle-power; (2), 24 candle-power; (3), 32 candle-power; (4), 50 candle-power; (5), 65 candle-power; † burn until midnight; A. N., all night; † to P. M.; K, kilowatt-hour; M, per 1,000 watts; L, lamp-hour; p, ampere-hour; † wood per cord; g, gas per 1,000 feet; \* without bonds; W, water power; d, doubtful. Interest on investment, depreciation, or taxes, etc., not included.



# THE WAYS OF THE BERLIN FIREMEN

**Apparatus Cumbersome But Adequate—Alarm Causes No Excitement—Thorough Inquiry into Causes of Fires—Responsible Party Punished**

*By James C. Bayles, M. E., Ph. D.*

THERE is a great deal that is amusing in the Berlin Fire Department but it is a long way from absurd because it is extremely well adapted to the needs of that city. Unlike the fire departments in American cities, the police and firemen of Berlin take things very coolly at a fire and manifest no undignified precipitancy in visiting the scene of the alarm. The firemen themselves are, in many cases, of large stature, and being of the peasant class are dull witted, good natured, lazy by habit, and almost incapable of much agility by reason of the large size of their feet. While the apparatus itself is good of its kind, as compared with American apparatus it is crude and rudimentary. Hand fire engines are still in use, and all the vehicles are, in respect to running gear, far heavier and much more clumsy than those in the United States. The steam engines themselves are much smaller than those of the American types, while the frames and wheels are heavier and more solid. The needs of the city, however, do not require that apparatus should make quick runs at an alarm, for the frame buildings and fire traps so common in America are unknown in the cities of these older countries, such as Berlin.

## PRELIMINARIES OF FIRE FIGHTING

A description of a fire which occurred in the apartments of an American, Prof. Boice, will show how leisurely a fire is treated by the officials. One cold morning Prof. Boice was awakened by his daughter, who told him the house was on fire. On entering the dining room he found it full of smoke and the fire eating its way down from the ceiling. Having a wholesome fear of the consequences of interfering in official matters, he rushed out to find a fire alarm station, which proved to be some three blocks away. The apparatus for actuating the electric signal is in a box behind a pane of glass, which must be broken to allow access to it. The penalty for carelessly or maliciously breaking the glass is serious, but a small reward is paid to the person who sends in an alarm if fire really exists. The minute the glass was broken two policemen appeared from opposite directions and, note books in hand, began to ask questions. "Who gave the alarm?" "Where was the fire?" "In what sort of a building was it asserted to be in progress?" Having answered everything he thought necessary, Prof. Boice started for home, but was courteously but firmly detained despite his statement that he had a wife and children in the burning building. He was forced to remain and be as patient as possible until the official investigation was complete and the most minute details noted down for future reference. Then one policeman sent the other to see if there really was a fire in the house, and after the return of the messenger with this information Prof. Boice was permitted to return home.

The fire apparatus soon began to arrive. The first on the scene was a first-class engine, which promptly drove away when the officer in charge was made aware of the fact that it was only a second-class fire. Another drove away because the house was in Charlottenburg, although the alarm had been sounded within the Berlin borough precinct. At last, eighteen minutes after the alarm, a wagon load of firemen of the proper class drove up and as many as received directions to do so buckled on portable extinguishers and entered the building. They looked at the smouldering hole in the dining room ceiling and stood around while their chief filled a memorandum book with notes. When he had secured every possible detail of information he assigned one man to one duty and another to another, which

was performed deliberately but thoroughly. In a few minutes the fire was out. It had originated from an ember which had fallen from a laundry stove in the attic above and onto the floor. All these facts were noted and diagrams made with accurate measurements.

When the fire was out the men placed their apparatus in the wagon and then returned with pails and house cleaning implements with which they began to clean up, removing all the debris, wiping up the floors and leaving everything as clean as though no fire had occurred.

To an American all this ceremony of formal procedure may seem like trifling and waste of time, but the Berlin officials understand themselves perfectly and usually do the proper and best thing under the circumstances. While they take even the smallest fire seriously, they never allow excitement to cause them to forget that they must obtain very detail of it to be submitted to their superiors.

The value of this is shown by what happened subsequent to this fire. Three days after the fire Prof. Boice was summoned before a board of inquiry and thoroughly questioned about the occurrence. After he had satisfied the officials that he was only a tenant and had nothing to do with the stove in the attic, he was dismissed. The janitor was then questioned as to the ownership of the property and everything he knew about it. The owner of the record was examined and also the previous owner. From their testimony it appeared that the laundry stove had been placed and set in accordance with local ordinance, but that the second owner had moved it for



BERLIN GAS (CHEMICAL) ENGINE

reasons of his own, and in re-setting it had not provided a fire-proof stove-board to go under it of the legal width, in consequence of which negligence the ember which fell from it reached the floor. He was accordingly assessed the cost of turning out the fire department and all the expenses to the city in consequence of the fire. To this was added a fine of three hundred marks for violating the fire ordinance. Inasmuch as no lives were lost and no damage to the property other than his own, he got off very easy.

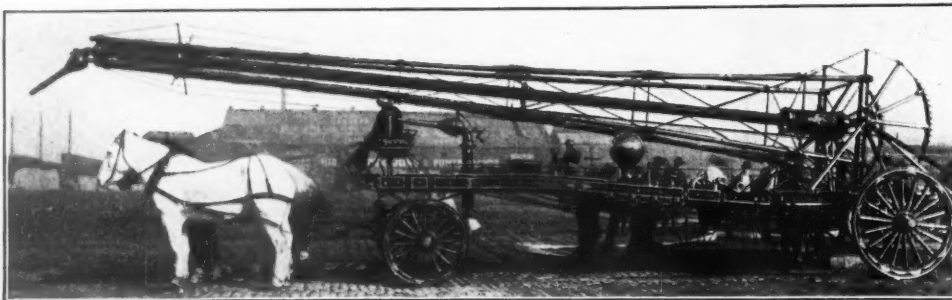
This description of a fire shows how thorough and painstaking are the officials in Berlin, and these qualities exist not only among the fire brigade, but extend to all the other departments, making it, probably, the best governed city in the world.

### Fire Fighters of 'Frisco

FROM a department in which politics was first, and efficiency as a fireman, second, the fire service of San Francisco, Cal., has been placed on such a footing that the first of these qualities has been entirely eliminated.

As at present constituted, the department consists of thirty-seven engine, nine ladder and seven chemical engine companies. All the latest equipments have been put in service, including two water towers and two "monitor batteries," which exclusively belong to San Francisco. The apparatus is manned by 475 officers and men who are permanent, the old call force having been abandoned entirely. A board of four commissioners is the governing body, and the executive force consists of Chief Sullivan, two assistants and seven patrol chiefs.

To round out new members into shape and to keep the old men in perfect condition, two training schools have been instituted, where the men are compelled to train three hours daily in life saving, ladder practice, etc. Every tool and piece of apparatus in the department is brought into play at these schools so that the men are thoroughly familiar with their use. In addition to these schools there is a house drill every day, and on Fridays the captain reads to the companies



WATER TOWER BUILT BY SAN FRANCISCO

the entire rules and regulations of the department, so that they will become thoroughly familiar with them. The men also practice the "covering-in" system on the board one hour each day. The alarm system has been greatly improved during the past few years. They run from one to seven alarms, the latter being general. The practice of studying the "covering-in" system every day makes it possible for every man in the department to know at any moment under any alarm where each engine and truck is located. Intermediate alarms may be omitted if necessary, after the first call, and the fourth, fifth, sixth or a general alarm may be rung in without causing the slightest confusion. While one engine is moving from its own house to that of another to cover the latter district, it is not possible for the men to know what alarms may have rung while they have been on the way, but by scanning the tape and the board on reaching the second engine house they know exactly what has transpired.

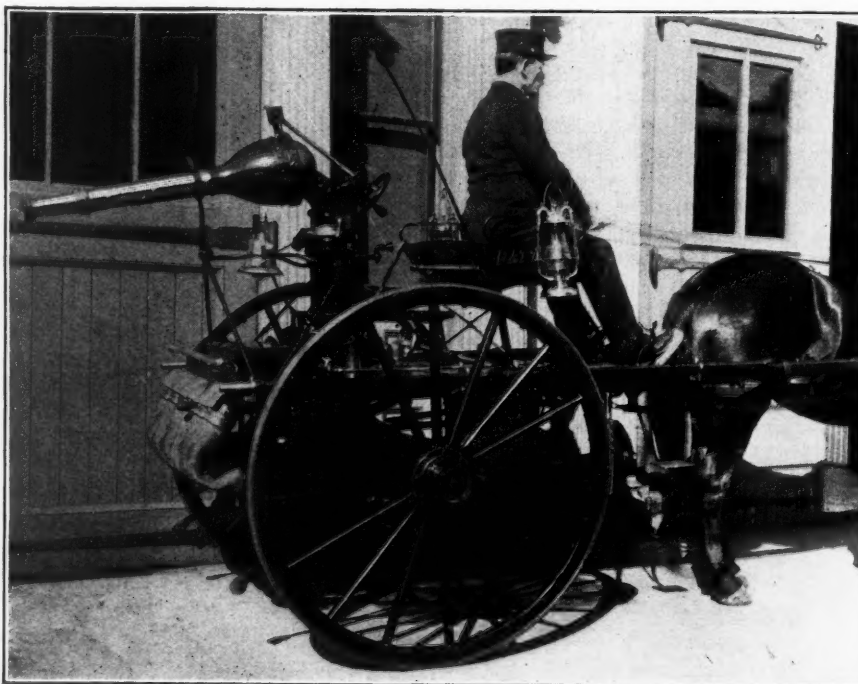
One of the unique pieces of apparatus which is in use in the San Francisco department is called the "monitor battery." This is mounted on two wheels and is for the purpose of taking the place of the water tower when the street or alley is too narrow for its use. It was invented by H. H. Gorter, the master mechanic of the department. It can be used in a basement blaze or in a four-story window with equally good results. Several lines of hose can be connected to it, and one man can easily handle this concentration of water. The accompanying illustration shows this apparatus, which is so well suspended when not in use, that the whole weight of it comes upon the wheels. When required for use, the table in which the nozzle rests is released by a lever, which throws it outward. The weight is then at once thrown between the toes at the end of the shaft and the axle,

giving the machine sufficient stability to sustain a backward pressure of 1,500 pounds to the square inch. The toes are spiked under the end of the shaft so as to obtain purchase upon the ground to prevent moving. The nozzle has an improved ball and socket joint which enables it to throw a stream of water at any angle, while it can move in a horizontal position on roller bearings. It is possible to attach six hose lines to this apparatus, and short flexible connections are provided for this purpose. The total weight of the battery is 1,650, and it is claimed that a solid stream can be thrown from two hundred to three hundred feet, according to the pressure.

The water tower, shown in the accompanying illustration, was also built at the department shops in 1898, and is the invention of Machinist Gorter. It has a telescopic tube with a ball joint, and is raised by water pressure.

### To Signal Approach of Apparatus

"THE City of Seattle, Washington, is experimenting with a signal erected at a street crossing in the congested sections to warn people of the approach of fire apparatus," says the *Firemen's Herald*. The signal consists of an iron box containing three incandescent electric lights. On three sides of the box are openings covered with red glass so that the lights inside throw the recognized danger signal of red. The light works automatically and in addition, there is a paddle or arm over the box that works up and down as the lights come on and so. Within the box is a gong which rings continually as the lights are working. The signal is operated entirely from the switchboard in the fire headquarters. When an alarm is turned in it is the duty of the man at the switchboard to start the alarm box working. The lights and the gong serve a double purpose. When the approaching street car is making such a noise that the gong cannot be heard the motorman can see the red lights and the revolving arm and he knows that fire apparatus is approaching. If experiments are perfectly satisfactory it is proposed to put up from eighteen to twenty



THE MONITOR BATTERY OF 'FRISCO

of these alarms at different points in the city. The location of the fire houses in Seattle is responsible for the experiments described. They are located on the high portions of the

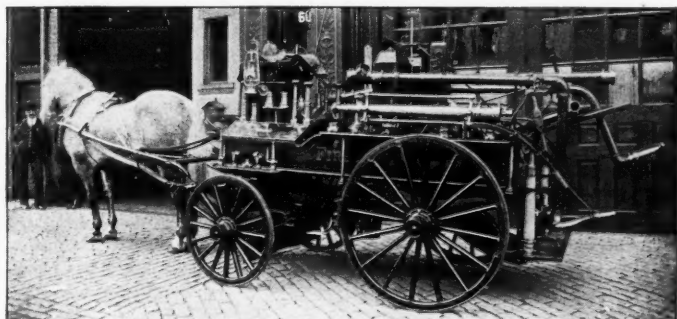


city and, consequently, when a fire occurs in the lower districts, the apparatus comes rushing down the hill, and there have been several serious accidents from collisions that have occurred with wagons and cars. It is thought that if the signals are placed on the corners, these accidents will be avoided, as motormen and drivers of vehicles will be on the alert to get out of the way of the apparatus. Seattle is probably the only city in which the fire houses are located in this way, and it would seem wiser if sufficient apparatus were placed in the lower sections of the city to take care of the ordinary alarms there.

### Fire Department Tool Wagon

THE question of attaching a tool wagon to the fire department of a city was discussed a couple of years ago at the annual meeting of the International Association of Fire Engineers, and Chief J. A. Archibald of Cincinnati, O., delivered a short but instructive address on this subject. While the subject in one respect is an old one, yet the fact that fire departments have not generally adopted the useful adjunct makes a short article on the subject one of interest.

In his address Chief Archibald said that the custom of carrying tools on fire engines and other apparatus was objectionable for many reasons, one of which is that not only do the extra tools take up room and discommode the members of the department, but they are very likely to be displaced in the hurry of getting to work. Chief Archibald has had experience with the tool wagon since 1891, and considers that his department could not get along without it. This tool wagon responds to all alarms in the crowded portions of the city, and carries not only the tools for the apparatus but also extra appliances. It is equipped with two, three and four-way Siamese connec-



TOOL WAGON OF CINCINNATI DEPARTMENT

tions and with 3 and 3½ inch hose to be used in the event of a large stream being needed. A great variety of pipes and nozzles are also on the wagon to replace any that might be broken. While working at a fire a plug catcher is likely to burst so this wagon carries extra appliances of this kind. Lever jacks, jack screws and wrenches of various sizes are kept on board to repair temporarily any accidents that might happen to the apparatus.

The city of Joliet, Ill., has one of these wagons in its department, and is so arranged that the apparatus is kept in different departments; thus tools that must be kept dry can be covered. This way of arranging things makes it impossible for them to get mixed up. This wagon is stationed at a fire and is in charge of two men, the driver and his helper. It is their duty to keep their wagon in a conspicuous place and stay there until directed to move elsewhere. Thus at all times it is possible for the firemen on other apparatus to find them at once. This wagon responds to all alarms including the first. After a fire it is the duty of the men in charge to see that everything that was taken out is returned to the wagon, and this relieves the department from the responsibility of picking up.

In Minneapolis, Minn., is a wagon of this character which is run in connection with one of the heavy trucks. All extra appliances are kept on board to duplicate any that may get out of order or be broken. This carrying of extra tools relieves the trucks of a great deal of weight which they would otherwise have to carry.

Several other cities have wagons that are used in case of accident to apparatus and are known as wreckers, but these are not properly tool wagons, for they do not accompany the other apparatus. They respond simply to calls for assistance when accidents occur.

### Motor Fire Engines in Hanover

GOOD success has attended the installation of a complete set of motor fire engines in the city of Hanover, Germany. Ordinarily the German firemen are very slow in getting to a fire, and, while the houses over there do not burn up so rapidly as they do in America, the quickest transit to the source of an alarm is always desirable. The accompanying illustration shows a group of these motor fire engines.



HANOVER'S MOTOR FIRE ENGINES

Each machine has two separate engines fed from the same boiler. The rear engine is used for propulsion, the system of transmission being by chains and spur wheels to two short countershafts mounted in bearings on the fixed rear axle. When the engine arrives at the fire, the valve supplying the rear engine is closed and the steam turned on to the forward or pumping engine. Time is economized by this means as there are no mechanical connections to be made. The rear engine is fired with liquid fuel and so can generate steam very rapidly.

### The Vienna Fire Department

THE firemen of the city of Vienna, Austria, serve not only to extinguish fires, but also at any large accident such as the collapsing of buildings, pursuing runaway animals, assisting the police in arresting lunatics, etc., but in the matter of fire department work they are rapidly being drilled to meet the modern requirements of up to date fire service.

Vienna has a population of 1,350,000 inhabitants and covers an acreage of 37,000. The department is divided into three sections: The first, embracing the metropolitan district, which is protected by 428 firemen; the second, made up of the immediate suburbs, while the third section contains the outlying and country portions of the city. In the second section there are ten volunteer companies with a roll of 371 men, while in the third portion the fire protection consists of twenty-four companies with 657 men. Except in the case of a large fire, the regulars confine their operations to the first section. The fire department has been growing very rapidly as is evinced by the amount of money expended for it annually. In 1880 the outlay was



VIENNA FIREMEN DRILLING

\$84,586 while at present it is \$300,000. The fire department of the first district is composed of the regulars and thirty-four volunteer companies with a total of 1,028 men. The watchers, or stations, consist of a central watch, a main fire watch, four engine watches, nine sub-stations and two hose fire watchers. When an alarm comes in six patrol wagons, five general wagons with tools and ladders, eighteen extinguisher carts, four platform extension ladders, seven steam pumps and five tender carts, can answer. In reserve are held two patrol wagons, twelve extinguisher carts, three extension ladders, twelve water pumps and seventeen water carts.

In the volunteer department are forty-two water pumps, three extinguisher carts, forty-four water carts, thirty-one patrol and outfit wagons, nineteen extension ladders and two steam pumps, with thirty water carts and hand-pumps in reserve. The regular department has 122 horses, while those for the volunteer apparatus are supplied by men in the carting business, under contract.

The telegraph alarm service consists of forty-five stations with 145 Morse printing apparatus, 207 telephone stations, 445 street alarms, fifty-eight indoor stations and 945 alarm bells in the houses of the volunteer men. During the year there was a total of 925 alarms.

Chief Eduard Muller is at the head of the Vienna department, which he joined as an officer in 1884, and has been its chief since 1895.

### Most Famous Fire House

WHAT is probably the most famous fire station in existence is what is known as "John Brown's Fort," at Harper's Ferry, W. Va. The well-known facts of the raid which was led by John Brown in 1859, need not be repeated, except so far as to say that the house in which he and his followers took refuge on the fatal day for his cause, was a building used as a fire engine station by the United States Government. The building was erected in 1842 by the Government for the purpose of housing two engines, and as there were no organized companies, employees of the United States Arsenal were accustomed to use these engines whenever there was a fire.

The engines were used by Brown and his men to barricade the doors of the house when they were attacked by the militia, but the engines were not damaged during the fracas.



"JOHN BROWN'S FORT"

In 1893 the whole station was transported to the World's Fair at Chicago as an exhibit. After the Fair it was returned to Harper's Ferry, and replaced in its former position and condition. The bell, which is shown in one of the illustrations, once hung in the cupola of the building, and was used to sound the alarm of fire. When the 13th Massachusetts Volunteer Regiment reached Harper's Ferry in March, 1862, the members of Company I removed the bell from the cupola and carried it to Maryland, where it was dumped into a canal for safe keeping. When the regiment left the vicinity they took the bell with them and placed it in charge of a lady who resided in Williamsport, Md. It remained in her back yard for thirty years. In 1892 when some of the veterans of this regiment visited Williamsport they found the bell where it had been left, and after paying for its care and storage brought it to their native town of Marlborough, Mass., where it now hangs on the outside of the G. A. R. building.—*Fireman's Herald*.

### Motor Fire Engines in England

THE automobile fire engine is being introduced into English cities. Some of these engines have been sold to cities on the Continent, and the authorities of the London fire brigade are contemplating putting one or more into commission.

The boiler is of exactly the same construction as the boilers employed in the ordinary horse drawn fire engine. It is of the vertical water tube type with a large number of horizontal heating tubes and a smaller number of vertical tubes arranged in two sets, one on either side. Water tanks holding 100 gallons partially surround the boiler. At the lower part of the boiler the ordinary fire-grate is shown in section. In the engine the fire-bars are removed, and the space designed for the reception of the coal is occupied by a large Clarkson 30-h. p. burner. This burner is heated to the vaporizing point by gas, which, when the engine is at the fire-station, is kept permanently on, and while keeping about 20 lbs. of steam in the boiler, maintains the Clarkson burner at a temperature which enables the oil to be immediately turned on as soon as the gas pipe is removed. The employment of gas in this way for maintaining permanent steam and heating the burner involves no additional expenditure in the use of liquid fuel, as the practice is practically identical with that adopted in existing coal-fired engines, the gas ring being employed in the grid above the banked fire while the engine is kept ready at the station. An intensifying steam jet is used in the Clarkson burner to draw in an additional amount of air with the vaporized oil. This works very effectively, giving an intensely hot blue and smokeless flame.

The framework of the fire-engine is of channel steel and the engine is mounted across it in front of the boiler and between it and the hosepipe box, the front portion of which forms the driver's seat, the side supplying accommodation for the firemen. All the parts of the engine are exceedingly well built. Steam pressure, sight feed, lubricators are employed for the cylinders and slide valves. A very substantial countershaft with differential gear nearer one end is carried by stout brackets secured to the framework slightly in front of the engine. The ends of this countershaft carry the chain wheels which gear on to corresponding chain wheels attached to the spokes of the driving wheels by means of Brampton roller chains of 2-inch pitch. When arranged for propulsion, the engine drives on to the differential by spur gearing. The smaller spur wheel is feathered on a prolongation of the crank shaft, and is thrown in and out of gear by means of a lever pinned in a quadrant which is situated on the far side of the vehicle. The pumps are situated vertically under the engine, each of the pump rods being provided with a threaded collar by means of which it may be attached to a screw sleeve projecting downwards from the crosshead of the engine.

The method of action is as follows: When ready to respond to a summons the engine has about 20 lbs. of steam, with the Clarkson burner so hot that the oil may be turned on at once in the manner we have described above. At the same time the crank shaft of the engine is in gear with the countershaft. As soon, therefore, as the required 60 lbs. pressure of steam is obtained the vehicle is ready to be started along the road to the scene of the fire. On arrival there the feathered spur wheel on the end of the crank shaft is slid out of gear, the crosshead lowered into its lowest position, each of the pump rods screwed on to it by means of the screw-sleeves described above, and the engine is ready to commence pumping. Disconnecting the engine from the countershaft and connecting it to the pumps can be done within 30 seconds, and the pumps, which are capable of pumping 300 gallons per minute, are consequently ready for action almost before the hose-pipe can be got out and unrolled.

Two long cylindrical tanks, which may be seen underneath the driver's seat, serve for carrying 30 gallons of oil, and pressure at 40 lbs. per square inch is maintained inside them by an air-pump working off the crosshead of the engine. The driving is on the Ackermann principle, with vertical pillar and wheel, and the engine is controlled by the throttle and by "linking up" in the ordinary way. A band-brake is provided on the countershaft and also a screw rim-brake, which can be applied on emergency by the attendant who travels on the rear of the machine. The wheels are of the artillery pattern.



## FIRE AND POLICE PERSONALS

—Captain Coverly of the Police Department of Spokane, Wash., has been appointed Acting Chief, by Mayor Byrne.

—Chief J. B. Gordon, of Haverhill, Mass., recommends that a flat car be procured to transport fire apparatus over the street car lines to fires in the outlying sections.

—Fire Department Chief Edward T. Cook, was recently appointed Superintendent of the Water Works by the Board of Water Commissioners. There is no salary attached to this position.

—Police Chief Engineer Murphy of Jersey City, N. J., has been after people who litter the streets with paper. He recently fined two citizens one dollar each for thus violating the laws.

—For the first time in the history of the department of Perth Amboy, N. J., a chief has been re-elected. The man so honored is Louis H. Franke, whose election met with little or no opposition.

—Chief Samuel Harner has taken charge of the fire department of Chester, Pa., to which he was recently appointed as head. He has been one of the most active members of the department, and has filled the position of Assistant Chief.

—Chief Foley, of Milwaukee, Wis., is experimenting with electric signals in hose so the pipemen can signal back to the engine. This has been tried in other cities with success. It was first used in Boston some thirty years ago by ex-Chief Damrell.

—The annual meeting of the Fire Underwriters was held in Atlantic City, N. J., on June 3. Mr. William A. Faunce was chosen president; vice-president, Crawford Miller of Philadelphia; treasurer C. J. Adams; secretary, Theodore Schimpf.

—Chief of Police Ames, of Minneapolis, Minn., has been acquitted of the charge of accepting a bribe for protecting confidence men under arrest. The trial has been a sensational one, in which the Mayor himself was involved, but it has ended fortunately for the Chief.

—Because Mr. L. M. Stroup, City Marshall of Fort Myers, Florida, asked for a cash bond in the case of a friend, one Sheridan, Sheridan became angry and attacked the marshal. It was a duel to the death and resulted in the marshal killing Sheridan with a revolver.

—Chief Croker of the fire department of New York is greatly in favor of the instalment of the salt water system in the Borough of Brooklyn. He says that a system of large sized mains running for about a mile from the river, with permanent pumping stations here

and there would furnish the supply of water adequate for any emergency.

—Assistant Fire Marshall James Brazil, of Rochester, N. Y., has invented a fire escape which has been given the name of the Rochester Fire Escape. The officials have given it a trial and pronounced it most effective. The principle is that of a continuous stairway, and it can be placed between windows so as to be out of reach of any flames that might shoot out.

—Chief Electrician Warren Fastnacht of York, Pa., while attaching a new spring to the bell clapper in the tower of the fire engine house, received the circuit through the body. An alarm of fire came in and he seized the wires with one hand and the clapper with the other, thus completing the circuit. He was not seriously burned despite the heavy current.

—Chief John H. Scott, of Milford, Mass., has resigned and Charles H. Cook has been elected his successor. Chief Scott has been an Assistant State Fire Marshal since the office was created eight years ago, and the only fireman connected with that office has been assigned to the Cape district, with headquarters at Fall River, where he will reside, hence his resignation.

—Chief of Police Kauffman of Walla Walla, Wash., recently accused one of the police judges of "standing in" with criminals because the judge released some prisoners after they have been arrested twice for the same offense. The Chief was fined for contempt and ordered imprisoned by the judge, but the police officers refused to lock him up and Mayor Babcock pardoned him.

—Mayor Bosch, of Hamilton, Ont., has recently had a controversy with Chief Kuemmerling of the Police Department, who ordered the police officers to ignore any orders given by the Mayor. It appeared that the Chief had sent orders to all the men to refuse to obey any one but himself. Director of Police Mason, upon complaint of the Mayor, instructed the Chief to rescind this order, and henceforth obey strictly any orders that the Mayor might give.

—Chief Meader of Oneida, N. Y., has been sued for failing to extinguish a fire that occurred over five years ago. The plaintiff claimed that, as the fire occurred within fifty feet of a stream of water and a well, and as the alarm was given in time, the fire should have been extinguished. He also claimed that the Chief did not send his men to the fire at all. The Chief holds that he considered the fire outside the village limits and so did not go to it.

**YOUNGSTOWN'S FIRE FORCE.**—The report of Chief W. H. Loller of the Fire Department, Youngstown, O., states that there are in the central station of the department, two 60-gallon combination chemical engine and hose wagons, with a full complement of hose, nozzles, etc.; one aerial hook and ladder truck with a 70-foot aerial ladder, a life net, one light service hook and ladder truck, and a Silsby steamer, which is held in reserve. There are two hose companies equipped with two-horse hose wagons and three hose companies having combination chemical engine and hose wagons. Chief Loller says that inasmuch as "an ounce of prevention is worth a pound of cure" he has inaugurated a system of building inspection which has resulted in the prevention of many fires. Not only does this inspection cause owners of houses to comply with the law, but it gives the officers a knowledge of the interiors such that in case of fire they can work to much better advantage. The Chief says that the time has arrived to abandon the direct pressure system for extinguishing fires and to institute a steamer service. Under the present system every time an alarm of fire is received it is necessary to increase the pressure on the mains from eighty to one hundred and sixty pounds, and this imposes a strain upon both the machinery at the water works and the pipe lines that necessitates constant repairs. He further recommends that three steamers be added to the equipment of the department. A three-way deluge set and 1,500 feet of hose is also recommended to be added to the department. While the fire alarm system has met all the requirements of

the year, the Chief recommends that a storage battery be substituted for the gravity battery system inasmuch as a great saving can be made in the matter of maintenance. During the year there were 230 alarms and the net loss by fire amounted to \$5,086.99.

**CHECKS CRIME IN ITS INCEPTION.**—Chief W. W. McDowell of the Police Department, Youngstown, O., says in his annual report that the policy of the department has been to suppress rather than to punish crime, and this has resulted in the large number of arrests that have been made during the last year. The Chief argues that by promptly arresting any one who commits even the most minor misdemeanor, "offenders are prevented from becoming bold enough to commit greater crimes, for but few enter upon a life of crime by committing a great crime at the beginning, rather approaching their commission gradually and through a series of petty misdemeanors." There is cause for congratulation that fully two-thirds of the 5,279 arrests for the past year were non-residents of Youngstown. The Gamewell system of police signals and telephones, which is under the management of City Electrician Perkins, has rendered its usual good service. The Chief recommends that a new lock-up be built to take the place of the present disgraceful building. He says that at present no attempt at sanitation or cleanliness can be successful and there is no arrangement for cleaning infected prisoners.

# WHAT POLICE AND FIREMEN ARE DOING

## Extension Searchlight—To Identify the Character of Milk—Department a Century Old—Improvements at Charlestown—Fire Hose Shut-Off

**POLICE TO CARRY DUSTERS.**—The unsightly marks that children make on the walls and copings on houses will not be allowed to remain in High Wycombe, a neighboring town of London, England. The police of this place have been furnished with dusters to rub out the scribbling.

**ORNAMENTAL POLICE OF STOCKHOLM.**—The police of Stockholm, Sweden, wear a uniform very similar to the dress of a brigadier general without the gold lace. They have helmets of steel and white gloves and carry swords. They seem to have been selected because of their fine appearance. They take little interest in what goes on in the streets and, while they are most courteous when addressed, seldom interfere with anyone.

**NOISY ALARM BOX NEEDED.**—Chief George W. Horton of the fire department of Baltimore, Md., recommends that a noisy alarm box be instituted for the purpose of preventing the sending in of false alarms. He suggests that an alarm gong be attached to the boxes so as to ring when the same is pulled. He considers that the old fashioned box with the gong attachment were in that respect to be preferred to the modern keyless boxes.

**EXTENSION SEARCHLIGHTS.**—At a recent fire in New York, it was found impracticable to throw the searchlight on a portion of a building facing on a narrow alley into which the engine could not go. Consequently one of the big lights was taken off of the engine, a reel of insulated wire was let loose and the searchlight was carried up the alley and supplied with the current through the reeled off wire. A barrel and a soap box made an excellent stand for the light. With its aid the work in the alley was completed in a short time.

**MEDALS FOR POLICEMEN.**—Chief Hayes of the Kansas City (Mo.) Police Department is greatly in favor of awarding medals to the police for bravery and good service. This is the plan that is in vogue in the cities of the East and the Chief, recognizing its virtue, wishes to have it adopted in his city. He feels that when a man realizes that some public recognition will be given of his conduct, all will strive to prove worthy of receiving this reward and the result will be surprising.

**NEW FIRE ORDINANCE.**—The fire ordinance of Jacksonville, Fla., has been changed so that it provides that all residences shall be constructed hereafter with a hollow wall. This means that there shall be four inches of brick or stone on the outside and inside of wall and a two-inch air space between them. The houses are not to be over two stories high and not to contain more than twenty rooms. These provisions apply to the houses within certain prescribed limits of the city.

**TO PUT IN FIRE MAINS.**—Chief Musham of Chicago is in favor of the plan to have a series of special fire mains through the streets through which a pumping station could force water at a high pressure. After the pumping station is installed it is the purpose of Commissioner Blocki to equip every downtown mercantile building with standpipes with sprinklers for each floor. The Chief thinks that the day will come when there will be no more fire engines and that the high pressure mains will take their place.

**FIRE DEPARTMENT OVER A CENTURY OLD.**—Woodbury, Pennsylvania, has a volunteer fire department, in which is a company now known as "The Friendship Fire Company," which originated in the year 1799. It was then known as "The Woodbury Fire Company." The effective apparatus of the old company was a hand engine, which is still in existence, and as the company had no hose, the engine was supplied with water from wells by means of leather

buckets and the stream was thrown from an old goose neck nozzle. The old company existed until the year 1830, when the present company was instituted.

**REDUCED POLICE SALARIES.**—Some of the members of the police force of Elmira, N. Y., had cause to mourn because of a reduction in their salaries. When the Board of Police Commissioners fixed the salaries for the force for the ensuing year, they abolished some offices, and reduced the salaries of others. Off of Chief Casada's salary \$300 a year was taken and he will receive but \$1,500 now. That of the inspector was lowered from \$1,200 to \$750, and of detective sergeants from \$960 to \$900. The cry of economy was the motive for reducing the amounts.

**FIRE LOSSES WERE SMALL.**—The report of Chief F. D. Applegate of the Hoboken (N. J.) fire department shows that the department is in fine condition. Quick response to alarms and system in fighting the fires have kept the losses down. There were 157 fires, 154 of which were confined to the floor in which they started or to the immediate vicinity. Only one found its way to an adjoining building. The total loss amounted to \$138,629. The large fire on the Phoenix docks made up the greatest part of the loss. The Chief recommends that a light truck be purchased to carry fuel to the engines. A forty-foot Seagrave ladder is also wanted for company No. 1.

**POLICEMAN AN ARTIST.**—A policeman in the town of Leeds, England, has been painting for several years, and this Spring his landscape "Summer" has been accepted at the Royal Academy. Happening to be stationed in the Leeds Municipal Art Gallery, he determined to be a painter and sent sketches to the local exhibition. Work was accepted at York and Derby, and in 1899 he won a first prize at Newark with "A Breaking Wave," while three other pictures received honorable mention. For three years he sent exhibits to the Royal Academy and they were provisionally accepted, only to be crowded out. This year he has been successful in getting a picture into the Academy.

**DEFINITION OF "ADULTERATED MILK."**—Health Officer Allen of Louisville, Kentucky, states that his department applies the name adulterated to all milk that comes under the following conditions: milk containing more than 88 per cent. of water; less than 12 per cent. of milk solid; less than 3 per cent. of fats or a specific gravity of less than 10.29; milk from animals fed on distilled waste, or any substance in a state of fermentation; milk drawn from cows kept in crowded or unhealthy condition; milk from which the cream has been removed; milk adulterated with water or any fluid or to which any foreign substance has been added. The department also holds that any cream sold or offered for sale must contain at least 20 per cent. of butter fat.

**MOST UNHEALTHY CAPITOL CITY IN EUROPE.**—Statistics show that the city of Madrid, Spain, is the most unhealthy capital in Europe. During the past five years among a population of a little more than half a million, there have been 79,374 deaths. In 1901 the number of deaths amounted to 17,242, which is a rate of about thirty-three per thousand. The dangerous condition of the city is just being realized by the police and various decrees have been published for the better enforcement of sanitary laws. Thus, no apartment or dwelling can be rented before it has been disinfected by the municipal laboratory department. One of the greatest evils in Madrid is the adulteration of food. The city is greatly overcrowded, 527,000 inhabitants being housed in 17,000 dwellings, or an average of thirty-one persons per house.



**PENSIONS FOR CITY FIREMEN.**—A bill has been presented to the legislature of Louisiana by Fire Commissioner Sullivan, of New Orleans fire department. The bill provides that all firemen who have reached the age of sixty years shall be retired and will be placed upon the pension roll. Every member of the department who has served twenty-two years will also be placed on this roll, as well as those who, while in the performance of duty, shall become disabled. A pension of \$50 per month will be paid to all those on the roll and every widow of a member who is on the roll or of any of the active force who shall be killed at a fire, or shall die within two months as the result of injuries received while on duty, shall receive a pension of \$25.00 a month, and every minor child of such a member shall receive \$6.00 a month until the age of sixteen.

**HEALTH DEPARTMENT TESTING NEW YORK 'MILK.**—During the first part of May the Health Department of New York City sent inspectors to meet all wagons coming from out of town with milk for the city, and as the wagons came from the ferries or other entrances into New York, the inspectors took the temperature of the milk and also tested its strength with lactometers. Samples were taken in sterilized bottles to be further tested at the Health Department's laboratories. Greatly to the credit of the dealers, almost without exception the temperature of 50 degrees was found to apply to the milk and the lactometers failed to show any water. The strict enforcement of the department rule with regards to milk has resulted in this good showing, for many dealers were fined during the first of the year for selling milk that was below the standard.

**TO IDENTIFY THE CHARACTER OF MEAT.**—A method has been devised by which the character of meat may be determined by Health Inspectors. This method consists in repeated injections of defibrinated blood of a higher animal into the peritoneal cavity of a rabbit. The serum obtained from the rabbit will give a precipitate when dropped into a clear solution of human blood, but will not do so with the blood of other species. Thus it is possible to recognize the character of meat offered for sale and to detect the fraudulent substitution of horse or other meat. A small portion of meat is scraped, soaked in water and the extract filtered. A precipitate is formed in this fluid if a small portion of the serum prepared with the blood of the same kind of animal is dropped into it. This test is especially useful to meat inspectors because of the fact that when meat is cut into small pieces it is almost impossible to recognize its character.

**IMPROVEMENTS AT CHARLESTON.**—Since the first of the year there have been many improvements in the fire department of Charleston, S. C. New horses have taken the place of old ones. New hose wagons have been purchased for three companies and wagon No. 1 has been equipped with a thirty-foot trussed extension ladder. Trussed and extension ladders have also been attached to the aerial truck. One engine has been rebuilt and all the apparatus put in first class order. The alarm system has been put on a modern basis and all the boxes have been supplied with glass covers and keys which will always be found in the lock. The glass is broken when the door is to be opened. The drill school has been training the new men in the science of fire fighting. Three times a week between 6:30 and 8 P. M., the men attend the school. It has been decided that, hereafter, no new man will be allowed to become an active member of the force until he has had a thorough schooling in this branch of the department.

**WORK OF THE DUBLIN FIREMEN.**—The tenth annual report of Thomas P. Purcell, chief of the Dublin (Ire.) fire brigade states that the total amount of property at risk from fire during the year 1901 was \$4,551,615, of which \$22,000 was outside the city. The total loss was \$152,390, which is about the average for the past twenty years. The brigade turned out to fires 118 times, all other alarms being answered by firemen with hand pumps. Three calls were attended outside the city. The staff consists of a chief, assistant, two inspectors, one station officer, one foreman and forty-two firemen. The total wages paid the firemen during the year was

\$19,096 and about \$46 were paid to some 116 supernumeraries who assisted during the fires. Larger mains are needed to supply the necessary pressure which was not adequate for the needs. Most of the alarms were sent in by telephone, some of them over the special direct telephone wire, but the Chief is testing a system of fire alarms for the public and will soon extend them generally throughout the city.

**FIRE HOSE SHUT-OFF.**—A member of engine company No. 1 of the department at New Britain, Conn., has obtained a patent on an invention known as a fire hose shut-off. It is a small vise-like arrangement having two jaws, which are easily forced together by two small handles. When a burst occurs in the hose the water may be shut off in a moment in the link below the break and a new link added. The hose is lifted a few inches from the ground and dropped between the jaws of the shut off. By raising two small handles the jaws are forced together and they remain in that position no matter what the water pressure may be. The advantage gained by the device is the time saved in going back to the hydrant to turn off the water until the hose is repaired. Heretofore if there were two streams of water playing on a fire from one hydrant, both streams would have to be turned off in case of a break in either hose. The device weighs about fifteen pounds and is made of malleable iron. It has been tested and proven perfect by engine company No. 1 at pressures of water ranging between 90 and 100 pounds.

**CITY TO PUT IN ITS OWN TELEPHONE.**—The report of City Electrician Diehl, of Harrisburg, Pennsylvania, recommends that the city install its own telephone instruments for the use of police patrol. Telephones should also be purchased for the fire alarm service as well, and these should be operated by the city so as to insure their being in good condition. The telephones that are already in the fire houses, and which are supplied by the local companies, could be entirely dispensed with, and the rental saved by the installation of city 'phones. The *Electrician* calls attention to the fact that many people hesitate about sending in fire alarms, preferring the telephone call, because of the fact that the fires are not serious enough to warrant a general alarm. He does not commend this idea, for while the majority of fires are not serious, yet there is no means of knowing when one will become so, and it is preferable to be on the safe side by sending in a general alarm. He recommends that all wires be placed under ground, especially in the business section, and inasmuch as the city has conduits awaiting the wires, all city wires should be immediately placed in them. All companies who desire to put down their own conduits should be permitted to do so and no exclusive franchise should be given to any company to lay conduits and force other corporations to place their wires in these conduits.

**BALTIMORE FIRE FIGHTERS.**—The work of the fire department of Baltimore, Md., for 1901 is partially outlined in the report of the Board of Commissioners and the Chief for that year. There were 1,498 alarms, an increase of forty over the year previous. The total losses were larger than those for 1900, being \$1,464,119. Two new engines and tenders were added to the force, 8,000 feet of hose purchased and the wires of the telegraph placed in subways. The Commissioners recommended that the salary of the Chief be raised as well as those of the Superintendent of the Fire Alarm Telegraph and the operators. The department cost \$497,039 to maintain, of which sum \$362,808 were for salaries. Chief George W. Horton reports that the apparatus consists of twenty-two steamers, twenty-one combination chemical and hose wagons, eighteen hose wagons, a water tower, one fireboat, eight Hayes aerial trucks, three combination trucks, a bank ladder truck and three chemical engines besides the necessary wagons for the officers. The reserve consists of six steamers, two Hayes trucks, a water tower, two combination hose wagons, five chemical engines and a wrecking truck. The Chief receives a salary of \$2,000 a year. He recommends that two steamers be purchased, also a large size aerial truck, the equipment of all trucks with Browder life nets and the placing of rubber tires on all aerial trucks.

# LITERATURE ON MUNICIPAL TOPICS

## Reviews of Some Important Books—What the Magazines and Reviews Have to Say About Civic Affairs—Municipal Reports Received

*The Municipal Year Book for 1902* is very much larger than the issue of a year ago. This was necessary by reason of the growing activity of local authorities. Especially is this so in the sections devoted to tramways and the housing question. In the latter subject the recent act that has been passed enables the authorities to build houses for the working classes outside of the boundaries of the municipalities, and this has been taken advantage of to a great extent. A new section has been devoted to telephones in this year's issue, being necessary by the competition which has sprung up between the authorities and the National Telephone Company. A list of Rural District Councils, with the names of the officials, has been added, and the whole book brought up to date in every respect. Copies may be secured by addressing Edward Lloyd, Ltd., Salisbury Square, London, England. Price 3/6.

For students of municipal problems a general review of the growth of cities and the development of municipal government is to be welcomed, especially if the work be as thorough and authoritative as Dr. John A. Fairlie's *Municipal Administration*. This book gives "a general knowledge of the whole field of municipal administration . . . and forms a groundwork for more detailed investigation for those who make this a special field for practical purposes."

Part I is a historical survey of cities both ancient and modern. It traces the old cities from their glory through their decline during the middle ages, their revival in modern times and assigns reasons for each step. From the time of Louis XIV., when the modern city began its existence, the author follows the course through the development of the English cities which were the first to feel the pressure of urban centralization and to devise plans to meet the situation.

Under Part II is considered Public Health and Safety, Charities, Education and Municipal Improvements. Under the last subject is discussed the problems of lighting, paving, sewage, highways, baths, parks, etc. The question of municipal ownership, so omnipresent at this time, must be decided, according to Dr. Fairlie, on general grounds. Whenever a private company is well-managed and is giving good service, he does not consider it good policy to run the risk of bad management with municipal ownership. Apparently he considers municipal control and the proper safeguarding of franchises a much safer mode of procedure.

Municipal franchises forms the subject of Part III. This takes in the expenditures, debts, revenues and administration of the cities of the world. Part IV is devoted to Municipal Organization. The final chapter, presents Proposed Plans of Municipal Organization. At the beginning of each chapter is quoted the authorities from which the author derived his information which, with the continual comparing of cities, makes the work of the greatest value as one of reference. Macmillan Company, New York. Cloth, 447 pages, price \$3.

THERE have been many large and exhaustive treatises on paving and paving materials, but what has been needed is a short, concise treatise on the present practice among cities relative to the laying of pavements, what kinds of pavements are most favored and how different kinds of paving materials are wearing. *City Roads and Pavements*, by William Pierson Judson of Oswego, N. Y., treats this broad subject concisely yet liberally enough to cover the main features.

The author is a well-known member of the American Society of Municipal Improvements, of the American Society of Civil Engineers, and of the English Institution of Civil Engineers, and the first edition of his book, issued in 1894, has had a wide circulation.

In this revised and enlarged edition, he has devoted a chapter to each kind of pavement, including "Ancient Pavements," "Block Stone," "Wood," "Vitrified Brick," "Asphalt," "Bituminous Macadam," and "Broken Stone," giving the latest records of methods and costs and using illustrations and tables for brevity.

A brief history is given of each pavement, its composition, method of laying, cost, durability, advantages and disadvantages, etc. Mr. Judson avoids the all-too-common practice of filling up pages with specifications which can be secured from city engineers for the asking.

The author has incorporated some practical and simple tests for cements that do not require the expensive apparatus and methods usually employed. These tests, however, are entirely adequate for the purpose of detecting a poor cement and can be made at a cost of but a few dollars. The first chapter contains instructions for the preparation of streets for the pavements, including their drainage, the use of road rollers, pressure of traffic and of structures. Throughout the work tables are given which tell the practice of many cities. Cross references show where the same subject has been treated elsewhere in the book from a different phase.

The 186 pages form a condensation of the actual results obtained on many works under varying conditions, and constitute a handy volume of fine appearance, which will be of interest and value to municipal officials and to all who are interested in road-construction, and especially to students who are preparing themselves to build roads and pavements.

The chapter on "Vitrified Brick" is, in part, re-printed in this issue of the MUNICIPAL JOURNAL AND ENGINEER, as being a most concise and clear discussion which cannot fail to interest our readers.

Excellent illustrations are given to show the several pavements treated and how they are laid. A full index completes the work. Published by the Engineering News Publishing Company, New York. Cloth, \$2. Second Edition revised and enlarged.

### Periodicals

In the *National Magazine* for July, 1902, is an article by John E. Monnot, Secretary of the Canton Board of Trade, on *Canton, Ohio, as an Industrial Centre*. Boston, Mass. Price per year \$1; per copy 10 cents.

*The North American Review* contains an article by E. J. Lederle on *Municipal Suppression of Infection and Contagion*. New York, June, 1902. Price per year \$5; per copy 50 cents.

*The Sanitary Condition of Street Cars in New York* is the title of an article by G. A. Soper in the *Sanitarian* for June, 1902. Price per year \$4; 35 cents per copy.

An article on *Improving the City of Washington* by M. Schuyler appears in the *Architectural Record* for June, 1902. New York.

The *Century* for July, 1902, contains an article entitled *A Campaign against the Mosquito* by Dr. L. O. Howard, entomologist of the Department of Agriculture. It tells the details of the operations that have been under way along the north shore of Long Island. Dr. Howard says, "It is my firm opinion that, widespread as the interest in mosquito-extermination seems to be at present, it is not a temporary interest, but the beginning of a great and intelligent crusade." New York, N. Y. Price per year \$4; per copy 35 cents.

*Insurance Engineering* for June, 1902, contains an article on *Fire Tests for Floors and Partitions*, being a digest of the official reports of tests conducted by the Department of Buildings of New York. Photographs and drawings show what tests were made and the results. Edwin O. Sachs contributes a 4,000 word article on *Fire Resistance of Floors and Doors*. It gives a description and the results of some tests made along these lines. New York, N. Y. Price per year \$3; per copy 25 cents.



Walter L. Hawley contributes *Personal Responsibility in City Government* to the July issue of *Gunton's Magazine*. He takes for his example the present municipal government of Mayor Low in New York. He says, "Mayor Low was placed in office by a combination of political organizations that were held together only by the common purpose to redeem the city from a rule of ignorance, extravagance and corruption. As soon as he was elected Mr. Low interpreted his success as a vindication of his theory that cities should be governed by individual servants and that parties should exercise no control and bear no responsibility. \* \* \* The plan of Mr. Low has been tried in many small towns and cities of the country, and in few cases has succeeded." Mr. Hawley says that the ones that are criticising the present administration are the large and steadily growing class of men who want office and who have been disappointed. New York, N. Y. Price per year \$1; per copy 10 cents.

*The Annals of the American Academy of Political and Social Science* for July, 1902, is the special annual meeting number and contains, among other interesting matter, discussions on *The Housing Problem*. Under this general caption appears a paper by Robert W. De Forest, Tenement House Commission of New York, on *Tenement House Regulation* and tells of the problem in New York. Miss Jane Addams of Hull House, Chicago, writes on the *Housing Problem of Chicago*, the Octavia Hill Association reports on *Certain Aspects of the Housing Problem in Philadelphia*, and Robert Paine explains the *Housing Conditions in Boston*. *Housing Conditions in Jersey City* are explained by Mary B. Sayles. *Probation and Juvenile Courts* is the subject of an article by Mrs. Emily E. Williamson, president of the New Jersey State Conference of Charities and Correction. This is followed by articles on the *Juvenile Court in Philadelphia*, by Judge Abraham M. Beitler, and *Juvenile Courts in Buffalo*, by Frederic Almy. Philadelphia, Pa. Price per year \$6; per copy \$1. Issued bimonthly.

## SHADBOLT WAGON WORKS REBUILT

**The "Up-to-Datist" Wagon Factory in the United States—New Machinery Throughout—No Better Garbage or Contractor's Dump Wagon Made**

THERE can be no progress in this world without resistance overcome. Every man and every firm is sure to meet resistance in some form. Besides the inevitable competition there are accidents, floods, and fires which often occur and wipe out, in the course of a few hours, the work of a life time. It was the unexpected which happened when a fire destroyed the plant of the Shadbolt Manufacturing Company, of Brooklyn, N. Y., last February. Long after business hours, in the middle of the night, a fire broke out in the main building, and despite the strenuous efforts of the well trained fire department, the whole group of buildings went up in smoke. All the work which was under way, including orders for contractors, dealers, and municipalities, was a total loss. Only a few valuable patterns, books, etc., were saved. But this did not discourage the Shadbolt Manufacturing Company.

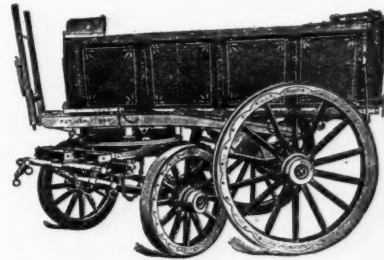
### RAPID RECOVERY FROM FIRE

Before the break of day the real work of reconstruction had commenced, and within three days temporary arrangements had been completed with neighboring manufacturers to handle some of the unfinished orders that required immediate attention. With characteristic energy the company pushed its plans for the reconstruction of its plant, and within a comparatively few weeks after the disastrous fire, had work under way under its own roof. There stands to-day upon the site of the old factories, an institution covering a much larger area, which may safely be described as the most up-to-date wagon manufactory of its kind in the United States. The equipment is of the best that money can buy. In some instances the machinery

resumption of business at the old stand. At the present writing everything is going at full blast and many orders are booked ahead.

### SHOWER BATHS FOR THE MEN

The fact that this company has looked out for the comfort and interest of its many employees cannot fail to interest our readers. Each man is provided with a separate locker, to which he carries the key. For the comfort of the men sanitary bath and toilet rooms



have been provided. These are light, roomy and airy and fitted with four shower baths. At the close of a day's work the men can quickly and thoroughly remove the stains of labor and go to their homes much refreshed and invigorated. The new factories have an abundance of air, and ample provisions have been made for adequate heating in the winter.

A glance at some of the remarkable pieces of machinery employed in the construction of this well-known wagon will be of interest. Mr. W. Oscar Shadbolt, the senior member of the concern, is a gentleman of ingenious ideas and much originality. The growth and progress of the business is largely due to his energy and the infusion of his ideas. For instance, he has arranged a kiln or drying room built upon his own plans. There is none like it anywhere. It is so constructed that the intensity of the temperature is under absolute control at all times by means of various devices of his own contrivance. This is one of the many methods employed to enhance the value of the materials used in the construction of this wagon. Another convenience is found in the large freight elevator made by the Graves Elevator Company, of Rochester, N. Y. This is one of the largest of its kind in the country. It has a capacity of 10,000 pounds and will carry a wagon 21 feet long and 10 feet wide. It runs from the basement, which is used as a stock room for all iron, steel, and metal employed in the construction of these wagons, to the top floor.

### REMARKABLE TIRE SETTER AND BENDER

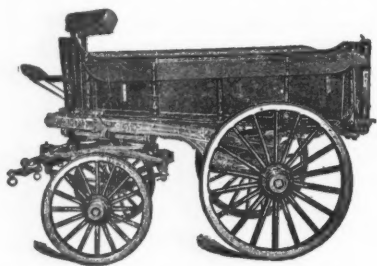
There are no machines which more thoroughly astonish the layman than the hydraulic tire-setter and the machine used for bending the tire. The former is the largest of its kind in the world. With its dies and other accessories it weighs fourteen tons and cost about \$3,000. It will take a tire one and one-half inches in thickness, eighty



has been specially made for this concern and there are no duplicates. The entire plant is fitted with the best tools, devices, machinery and apparatus that can be found in the country, and the beauty of it is that the entire outfit is up to date—that means, up to August, 1902.

Fortunately for the company, the lumber on hand, of which there was a large amount, was located in a yard a block away, so that most valuable material was saved. This permitted of a more immediate

inches in diameter, up to six inches in width, and weld and set the tire on the wheel much more perfectly than can be done by hand. A tire so set will outlast any tire set by the old process. The machine for bending the metal of which the tire is made is another invention of Mr. Shadbolt's. The machine was designed, patterns made, and the whole thing set up in his own shop. It worked so perfectly that



some of his friends who were in a similar line of business, asked for, and secured, the use of the patterns so that they could construct similar machines for their own use. There are only two of these in the world; one in the South and one in the West. This machine will take a piece of iron or steel from any width up to fourteen inches and up to two inches in thickness and bend it perfectly to any required size. This work is incomparably better than that produced by the old methods. It has not only been a great saving to the company but it also insures a stronger wheel for the wagon.

This brief reference to a portion of the outfit of this concern does not begin to do justice to the subject, but it will give an inkling to the busy reader of the trouble and expense involved in the construction of this particular wagon.

#### THE PRODUCT OF THE FACTORY

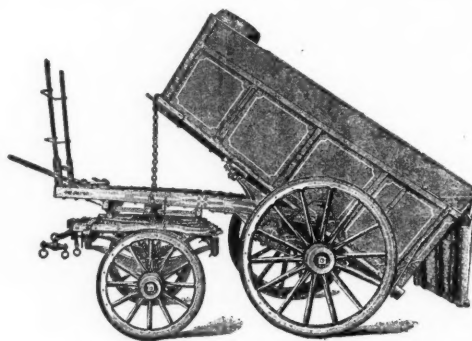
Now we come to the product of this factory. Mr. Shadbolt in referring to the general subject of construction of dump wagons, said, "All dump wagons heretofore built had one or two serious defects. Either the weight is carried entirely on the hind axle or nearly so, thereby adding very largely to the difficulty of draft; or rollers, or some complicated machinery are used to shift the main body back on the supporting frame, so as to cause the center of gravity to come back of the axle and allow the body to tilt.

"I have experimented for a long time to produce a wagon in which the load is properly distributed over the two axles and at the same time be able to tilt it at a proper angle to cause any kind of load to run out without shifting the body in the least. I am pleased to say that the desired result has been achieved, and will be readily seen by any one who examines our wagon.

"My experience of many years in the wagon business has taught me that simplicity in construction is a most desirable quality. For this reason this wagon has no rollers, tracks, racks or levers. The wagon can be unloaded by the driver without leaving the wagon. At all times the angle of elevation is entirely under control, and any portion of the load that is desired, can be taken out at a time. The capacity of the wagon is almost unlimited. There are Shadbolt wagons in use to-day which have a carrying capacity of four and one-half tons of asphalt. The fact that this immense load can be easily drawn by two horses is sufficient evidence that its ease of traction could not be better."

#### TESTIMONY OF SUPERINTENDENT BROWN

It may safely be said that there are no better wagons made for the use of the contractor, street cleaning or garbage department, than the Shadbolt. It is made in all sizes and adapted to all needs. Superintendent of Streets Brown, of Cambridge, Mass., two or three years ago refitted his department with the Shadbolt dump wagon. He had been using sixteen one-horse carts, holding a little more than one and one-half yards each, in connection with his ash collecting service. He felt that a dump wagon should be used for this purpose, and, accordingly, purchased nine large two-horse dump wagons of the Shadbolt Company, each with a capacity of nearly six yards. They cost the department \$3,213. On casting up department accounts at the end of the year, Mr. Brown discovered that the large wagons had



saved the department something over \$5,000. In other words, during the first year's use the wagons had more than paid for themselves.

For the benefit of our readers we here reproduce some of the types of wagons constructed by the Shadbolt Manufacturing Company. A large illustrated catalogue, together with further particulars about the wagon can be secured on application to the Shadbolt Manufacturing Company, Flushing avenue, Brooklyn, N. Y.

## A 20th CENTURY DUMP WAGON

**Adapted to All Classes of Work Where a Wagon Can Be Used—Automatic in Its Action—  
Easily Handled and Durable**

THE demands of the new century for improved apparatus and appliances in the construction and maintenance of the municipality have been felt in every line of work. The public has demanded better pavements and has secured them; it has asked for rapid transit and has received it. In response to the same appeal the improved dump wagon, for the use of contractors, teamsters, brick manufacturers, sand men, manufacturing plants, garbage and street cleaning departments, has been produced. The Victor Dump Wagon may be rightfully called the 20th Century dump wagon, as it is built on honor and is sold on its merits, and as it meets all the requirements.

#### HIGHLY SPOKEN OF

Those who have used the Victor say that it will save its cost in a few weeks, will dump the load just where it is wanted—off the bank, on an incline, on the level, or distribute it for grade work. The driver can dump the body without stopping the team, and therefore never finds it necessary to leave the wagon when the load is dumped. Neither is it necessary to have the forward wheels in a particular po-

sition in order to dump the load, for it can be dumped equally well regardless of their position. The Victor always dumps the load to the rear; in drawing away, the horses do not have to draw the wagon through the load. The load is not dropped, but slides out; consequently bulky materials and other articles requiring careful handling, can be dumped without breakage.

The Victor has been thoughtfully constructed. Its inventor sought to adapt it to every use for which a wagon of this kind can be used, and the result leads one to believe that he has succeeded admirably well. There is no complicated machinery to clog, get out of order, or break. The wagon is short geared, the center of the load being only six feet and two inches from the hitch of the horses, which makes it compact and easy running. It is no higher from the ground than an ordinary wagon. The body is absolutely tight so that there is no chance of leakage, and the general wear and tear of the wagon does not affect this desirable feature. Its turn-under platform gear enables the wagon to be turned in its own length, which is only ten



feet. The Kautz patent fifth wheel, a simple but perfect device that will allow either one of the forward or hind wheels to go over a fifteen inch obstruction without strain of any kind on the king bolt, or whipping of the pole, is used in the construction of the Victor.

#### A FIRST GRADE WAGON

The builders of this wagon claim that it is an A-grade wagon throughout, being made from the highest quality materials by skilled mechanics and that it will outwear two ordinary wagons. Moreover, they maintain that they give a broader guarantee than is given for any other dump wagon in the world. "In reality," said a contractor who had used the Victor for a long time, "it is two wagons in one. It can be changed in a few moments to a regular wagon by taking off the dumping body and adjusting a hanger across the rear end of the outside frame, then by placing in some planks for bottom boards you have a first-class wagon in every respect for drawing building stone or other heavy articles that you do not wish to dump."

Figure No. 1 shows the standard wagon ready to receive its load. It will be noticed that the height of this wagon is no greater than that of an ordinary wagon; the distance from the ground to the top of the body, by actual measurement, being only four feet and

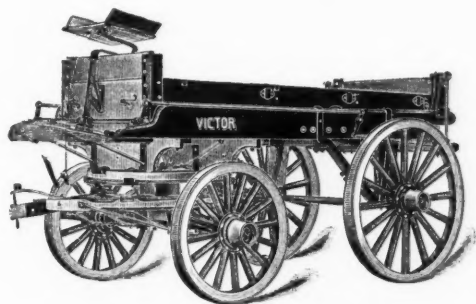


FIG. 1

six inches. As shown in the illustration, the wagon holds one cubic yard. The top side boards which are included with this wagon, increases its capacity to one and one-half yards. It will be noticed that they are not in position in the illustration. Although it dumps automatically it never dumps accidentally. One of its good points is that it can be dumped only by deliberate purpose.

In Figure No. 2 is shown a cut of the wagon dumped. Here it is desirable to notice the very simple but perfect dumping device attached. For instance, in dumping the load the driver merely stands, holds the reins in his hands and pulls the seat forward; this unlocks the body in front, as will be noticed by reference to Fig. No. 1, and at the same time releases the hanging support at the hind end (see position of seat and hind end gate) the body being balanced on



FIG. 2

iron trunnions, then drops by gravitation over the hind axle, which is cranked to run under the center of the body. The axle is securely clipped at this point to the outside girders, making a very strong and rigid connection. It may be said here that the builders of



FIG. 3

this wagon give an absolute guarantee as to the strength and durability of the hind axle.

#### A STRIKING FEATURE

One of the most striking characteristics of the Victor is shown in Fig. No. 3. Here a front view is given with one of the forward wheels elevated fifteen inches, illustrating the working of the Kautz patent fifth wheel, one of the most practical inventions of recent years. It does not seem credible that the wheel of any wagon can pass over an obstruction of this kind without bringing a heavy strain upon the king bolt, but nevertheless it is an absolute fact that there is no strain on the king bolt, no whipping of the pole, no wrenching of the load and that it is utterly impossible to bind the circle. The fact of the matter is that this wagon is so constructed that the wheels readily conform to every unevenness of the road without any strain whatever to the wagon. This insures its durability; besides it practically guarantees it to be an easy running wagon.

The Victor is built by the Victor Wagon Works, Troy, N. Y. The company, in speaking of its guarantee, writes, "We warrant the Victor Dump Wagon to be well made of thoroughly seasoned material, and of sufficient strength to carry the weight mentioned in our catalogue. If any breakage occurs within one year from date of sale, owing to defective material or workmanship, we will furnish new parts at our factory free of charge, upon the return of the defective parts."

"On account of the hind axle of the Victor Dump Wagon being different in shape from the ordinary style of axle, we specially guarantee this axle, with the brace adjusted, to equal in strength and durability any other axle of the same size arm."

"We guarantee the wagon to be high grade in both material and construction."

"We warrant the wagon, with proper handling, to do everything claimed for it in this catalogue in a workmanlike manner."

#### A Magazine of Travel

The July number of the Four-Track News contains the usual variety of interesting and valuable reading matter, together with some of the most beautiful illustrations that have ever appeared in an American magazine. Among the subjects treated are "The Home of the Caribou," by H. A. Morine; "The Wonders of Electricity," by Frank H. Fayant; "A Mecca of Patriotism" (Monticello), by Bessie H. Dean; "The Beautiful Berkshire Hills," a comprehensive and beautifully illustrated picture of that picturesque country, by Howard W. Coggeshall; an article on "Camping in the Adirondacks," by Harry V. Radford; "A Literary Hermitage," "A Zoological Prize," an article on Saratoga and another on Fort Snelling. There are also the usual departments, poems, verse and all profusely illustrated. The frontispiece is a striking picture, "A Newfoundland Iceberg on Its Way South"; the "Little Histories" in this month's number treat of "Washington's Cave," "The Alien Cypress," "The Lincoln Monument," "Lovers' Lane" and "Uncle Tom's Cabin."

The Four-Track News is fifty cents a year, five cents a copy, and can be had of George H. Davis's, General Passenger Agent, Publisher, Grand Central Station, New York.

### An Efficient Fire Detector

DURING the year 1901 the estimated cost of property destroyed by fire in the United States and Canada amounted to \$164,347,450. This could have been considerably reduced by using an ordinary amount of precaution. Much of this loss was caused by electrical conductors. It is therefore imperative that there should be the utmost caution used in having a proper fire alarm system or method of detecting a fire in its incipency.

Ordinary thermostats properly installed are of value. Their value, however, can be enhanced many fold by connecting them with fire detecting wires, and extending same to locations where thermostats themselves are not practicable. A fire detecting wire in the immediate vicinity of flame will give an alarm considerably before the temperature of the room is raised to the thermostat alarm point.

"Fire Detecting Wire" means much. That a piece of wire or cable can, itself at every infinitesimal point be rendered delicately sensitive to flame or dangerous heat, is another of the valuable applications of electricity.

Reels of Fire Detecting Wire can be easily and cheaply placed upon the walls of storehouses and at night the wire led over the piles of inflammable material. No better application of electricity can be contemplated. Properly connecting the real terminals to an annunciator would give a fire protection positively positive.

The rendering of every point of ordinary electrical conductors into fire detectors is the accomplishment of Montauk Fire Detecting Wire. The detective feature is an added detail, interfering in no way with the efficiency of the conductor for its primary service.

To protect life is to save it, and no greater protective device has, as yet, been constructed than the one known as "Montauk," which is manufactured by the Montauk Fire Detecting Wire Co., 100 Broadway, New York. The company will be glad to send full particulars, printed matter and list of installations on application.

### Electrical Air Compressors

PNEUMATIC tools and other appliances for the utilization of compressed air have been introduced into one field after another with such successful and gratifying results that the advantages of using compressed air for a wide variety of purposes are now fully recognized.

The present general use of electricity renders it advantageous to operate air compressors with electric motors. The convenience and economy of this method is apparent when it is remembered that an electrically driven compressor can be operated from any lighting, power or railway circuit that may be available.

To meet the constantly increasing demand for an electrically driven, simple, compact air compressing unit, the Christensen Engineering Company, Milwaukee, is manufacturing a complete line of electric-driven compressors ranging in capacity from  $7\frac{1}{2}$  to 1,000 cubic feet of free air per minute. The smaller sizes are made for portable as well as stationary service.

The type "M" motor-driven air compressor illustrated herewith, is for stationary continuous service. It is built in capacities from 50 to 1,000 cubic feet of free air per minute.

The electric motor and the compressor have been designed to form a compact self-contained unit. The entire machine is mounted on a substantial cast iron base. Both the cylinder and the valve heads are water jacketed throughout, and the clearance spaces have been reduced to the lowest practicable limit, thereby correspondingly increasing the economy.

The gear case and the crank chamber are connected and form an enclosure which is partly filled with oil, with which all the working parts are automatically and continuously lubricated, including the air cylinder. The latter is connected with the oil chamber so that the proper quantity of oil for lubricating the surface between the cylinder and the piston is automatically supplied and no sight feed lubricator is required. Experience has shown, that, after being supplied with oil, the compressor runs for several weeks before replenishing is necessary.

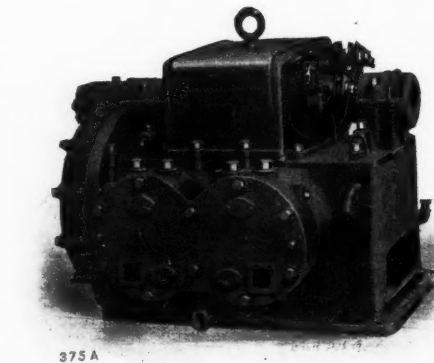
Either an alternating or a continuous current motor may be used.

The design of the motor and compressor is such that every part is easily and quickly accessible.

An automatic governor starts and stops the motor compressor at the desired minimum and maximum pressures. It is a very simple piece of apparatus, and by its use it is possible to get a close margin between maximum and minimum pressures. This margin is readily adjusted.

A small compressor for stationary continuous service is built in capacities from 4 to 35 cubic feet of free air per minute.

These are known as type "L" and are similar in design and construction to the type "M" referred to above. This compressor is a modification of the type "H," the water jacketing feature being added to make it suitable for continuous service. Type "H" is the Christensen motor driven compressor so well known in the electric railway field.

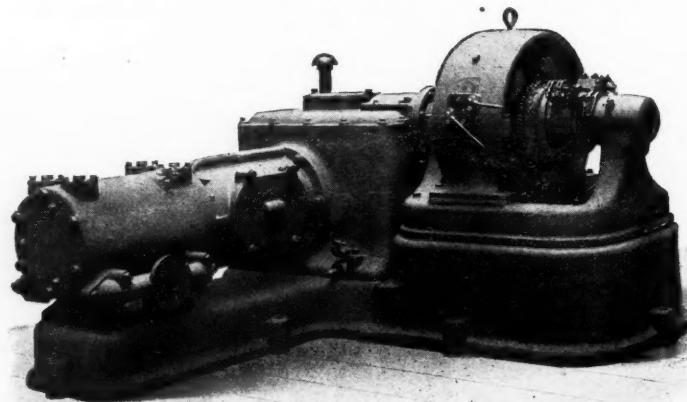


TYPE L, MOTOR DRIVEN AIR COMPRESSOR

More than five thousand of them are in daily and highly satisfactory use in connection with the Christensen air-brake equipments on electric cars throughout the world.

The illustration of the type "L" herewith shows the well-known continuous current type that the Christensen Company have made for several years for use with its air-brake equipments on electric cars. They are four pole series wound motors with two field coils and have cast steel frames and cast steel poles. All the other important features of the motor are similar to those used with the type "M" compressors.

For portable service the Christensen Company mount its type "H" compressor with the automatic governor and air reservoir, on a suitable hand truck which can be easily and quickly moved wherever necessary.



TYPE M, MOTOR DRIVEN AIR COMPRESSOR

able hand truck which can be easily and quickly moved wherever necessary. This portable outfit, known as type "I," has a very wide field of usefulness wherever pneumatic tools or other compressed air appliances are used and an expensive system of piping is not desirable. The compressor is taken to the work instead of transmitting the compressed air from a stationary compressor at a distance.

These compressors are frequently mounted on a wagon instead of a hand truck and transported by horses for use in drilling and bonding rails, etc., in electric railway or other work where electric power can be obtained.

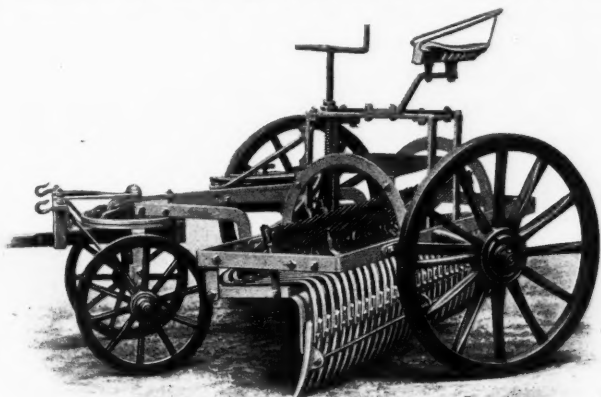
It is also practicable to make the smaller sizes of the type "M" portable; especially where the truck, upon which the compressor is mounted, is arranged to run on rails.

More detailed information regarding these interesting types of compressors may be obtained by sending a request to the Christensen Engineering Co., Milwaukee, for a copy of its catalogue.



### A Popular Street Scraper

AN extremely useful and economical machine and one almost unique in its construction and operation, is the American Barnard Castle Road and Pavement Scraper, which we illustrate with this article. The special advantage of this machine is that on all kinds of pavements, including Macadam roadways, no matter whether the surface be uneven or otherwise, the accumulation of dirt and refuse can, by this automatic scraper, be thoroughly and economically removed, and at less than 1-6 the cost of a hand scraper. The line of scrapers, or, technically speaking, "teeth," is composed of a set of teeth, each about 3 inches in width. Each of these teeth is kept close to the pavement by a spring acting independently on each tooth. By the



AMERICAN BARNARD CASTLE ROAD AND PAVEMENT SCRAPER

pressure of the spring upon the arm carrying the tooth, it drops itself into any depression of the uneven pavement and does its work of cleansing thoroughly and without failure. At each passage of the scraper a width of roadway measuring  $6\frac{1}{2}$  feet is cleansed, and as the horses drawing the machine will travel at the rate of 3 miles an hour, it is easy to accomplish the cleansing of any description of pavement at the rate of from 10,000 to 12,000 square yards an hour. There are upwards of 4,000 of these machines in use, and recently several have been supplied to the Department of Street Cleansing, New York City, and to the Public Parks in the boroughs of Manhattan and Bronx, New York City. This road and pavement scraper is manufactured by William C. Oastler, 156 Fifth avenue, New York City.

### How to Protect Public Documents

THERE was a time when it was impossible to protect valuable records and public documents. Then there was good excuse for municipalities which were unfortunate enough to be visited by a fire which destroyed these records, provided they took the ordinary precautions to avoid loss by fire. But to-day there is no excuse whatever for the modern municipality, be it large or small, if it loses its records and valuable historical documents by fire. The inventor in the meantime has been at work and produced devices and methods of fire proofing which are most efficient. For example, The Art Metal Construction Co., of Jamestown, N. Y., has revolutionized the handling of metals used in fire proofing construction. What was once thought to be impossible it has successfully achieved. Fire proof vertical letter files, letter filing cabinets, card index drawers and cabinets, cheque files, vaults, vault equipments of all kinds, and in fact, every appliance which may be used about an office, even to the roller top desks, are now made fire proof by this well-known company. The first cost is a trifle more expensive, but the lasting quality and the fact that these appliances are fire proof, more than counter balance the difference in price as compared with wood furnishing.

Illustrated catalogues and booklets will be furnished on application. But no booklet can more than suggest the extent of the complete line of metallic furnishing for public buildings and offices. It would need a visit to the works at Jamestown to give a comprehensive idea of the numerous articles of office furniture which are turned out by this company. This metallic furniture has a highly artistic value as well.

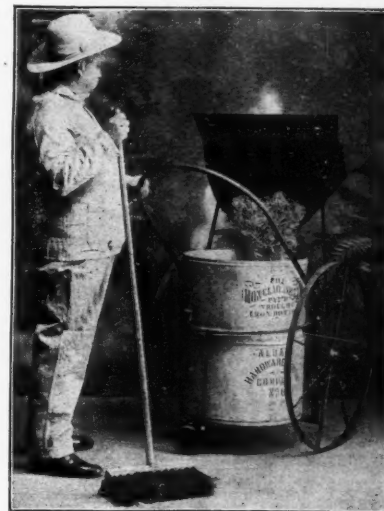
It has no garish or pressed effects but its choice wrought work, with mouldings, trimmings, and is finished handsomely throughout. Municipal officials will be astonished when they investigate this subject to find that the fixtures necessary to equip a public building from top to bottom are made out of metal.

### Menzies' Street Cleaner

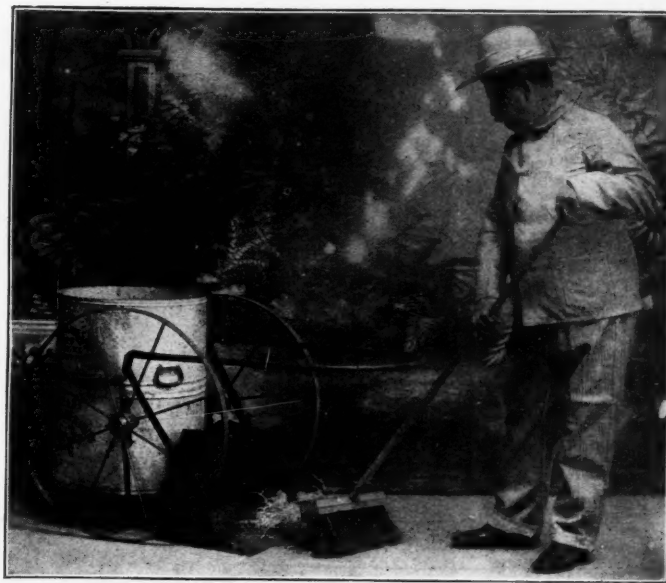
SMOOTH pavements in the city streets are becoming almost universal. The cobblestone pavement is a thing of the past. The public demands that smooth pavement, when constructed, shall be kept clean. The question arises in every municipality, How can a pavement be kept clean with the least expense?

The Menzies street cleaner is the only machine that combines all the elements necessary for keeping the street clean at all times with the least expense. The horse sweeper cannot be operated during the business portion of the day, and with that alone, dirty streets during the business portion of the day are unavoidable. The odor arising from some contrivances, is wholly done away with. The various other methods of shoveling the dirt into a can, or wheelbarrow, or some other receptacle, and then dumping it into a pile upon the pavement to be again shoveled up and taken away, are expensive operations which this machine is designed to avoid.

This street cleaner enables the workman to keep clean about 50 per cent. more street surface than any other similar machine or contrivance on the market, and will thus save its price in a month or two. It dispenses with the use of a shovel altogether; the refuse is deposited in a can with one action; it is neat, clean, strong and durable.



EMPTYING THE PAN



LOADING THE PAN

With proper usage the machine will last for years. In fact, the only part subject to much wear is the dust pan, which can be replaced at little cost. The accompanying illustrations give a good idea of its manner of construction and how it is worked. The machine is already in use in a score or more of cities. Fuller particulars may be secured by addressing The Menzies' Street Cleaning Company, Glens Falls, N. Y.

### Precaution Against Fire

REPORTS come to hand daily of conflagrations in various parts of the United States which tell of thousands of dollars worth of property destroyed and many lives uselessly sacrificed, much of which might be easily averted at a small expenditure. Reference is here made to buildings which are not fireproof but might be made partially so, or enough so to prevent them from catching fire from other buildings. The recent big fire, in the old-fashioned five story brown stone building at 601 Broadway, New York City, may be cited as an instance. This proved to be one of the most dangerous fires of the year, some of the firemen being badly hurt and for a time the entire block was threatened. The *New York Sun*, of July 7th, had this to say: "The windows on the side projecting above the roof of the building which was on fire are protected by iron shutters. The wind was blowing from the South but the flames were powerless to spread to the adjacent structure." It will be seen from this that had not the iron shutters been fitted on, the entire block might have been fire swept, as they are all old structures.

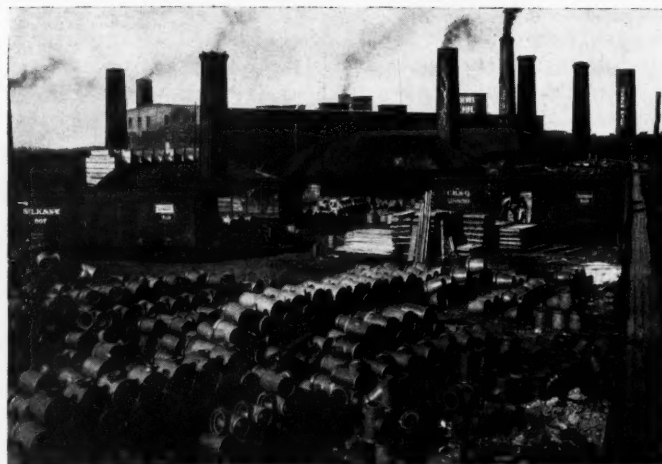
The same may be said of the big fire in Chicago in 1897, which destroyed the Wholesale Dry Goods Co., south of the Marshall Field wholesale stores. The Chief Engineer of that building, which was equipped with the Clark Patent Revolving Steel Shutters, said afterwards that the shutters were at time almost to a white heat and but for them, the Field building with all its contents would likely have been destroyed. They were afterwards repainted and stand to-day as striking evidence of their efficiency and durability.

Many courthouses, public institutions, banks and other buildings throughout the country are fitted with these fire and burglar proof shutters, which were originally patented by Mr. Clark, late of Clark, Bunnett & Co., now called the Rolling Steel Shutter Works, located at 162 and 164 West Twenty-seventh street, New York City. Particulars with list of buildings on which shutters are fitted on application.

### Sanitary Appliances

NOTWITHSTANDING the fact that the cities of the United States are comparatively young, the sanitary conditions are equal to those found in most of the older cities of the Old World, and better than some. This condition of affairs is more largely due to the efforts of the manufacturer than to the skill of the sanitary engineer. The latter calls attention to the need of sanitation, gives an idea of how unsanitary conditions may be remedied, but it has always remained for the manufacturer to supply the most perfect sanitary appliances. American enterprise in this field is something phenomenal. All sorts of difficulties, many of which seem insurmountable, are overcome by the ingenious methods employed by the manufacturer in producing just the article needed.

Among the many firms supplying sewer pipes, catch basins, conduit pipes, meter boxes, and a lot of other articles used to make the modern city healthful, the Monmouth Mining and Manufacturing Co., of Monmouth, Ill., is among the best known and the most reliable. The accompanying illustration gives a glimpse of a small portion of the plant located in this Illinois city. The concern has been engaged in the manufacture of vitrified clay pipe for over



A GLIMPSE AT A PORTION OF THE PLANT

thirty years. Its long experience enables it to turn out a maximum amount of ware at a minimum cost. The supply at the command of this company is inexhaustible. The shipping facilities are among the best, as four of the large trunk lines pass through the city. The Monmouth standard and double strength sewer and culvert pipe, which is unexcelled for strength and durability, is a synonym for worth and quality. Full particulars about the goods manufactured will be sent to any address on application to the manufacturer.

### Public Fountains

The fad for improving and beautifying cities is rapidly developing into a craze. Municipalities, large and small, from the Atlantic to the Pacific, and from the Lakes to the Gulf, are interesting themselves in plans for beautifying the city. Those who invest in public fountains or drinking fountains will expend their money wisely, for they will not only add to the attractiveness of the city but also supply a public need. Comparatively speaking, water is free, but there are very few places even in the larger cities where the general public may secure a refreshing drink of water without entering a saloon or visiting a drug store. All municipalities should undertake to supply general public needs, particularly free drinking water. This can be done at slight expense, and if a wise choice is made in the selection of drinking fountains it will tend to beautify the city, and at the same time supply a long felt want.

Too few public parks are fitted with large size ornamental fountains. There can be nothing more attractive in a public park than one of these large fountains, or if not placed there, at the entrance or in some prominent square. It is sure to attract the attention and furnish impressions which cannot fail to lighten the burdens and the weary and heavy laden.

The large number of designs, of both ornamental fountains and drinking fountains, which are found in the large catalogues of the J. L. Mott Iron works, 84 Beekman street, New York City, and 311 Wabash avenue, Chicago, Ill., furnish ample opportunity for appropriate selection of fountains to fit any location, whether it be in front of a park or in a small or large public square. Numerous designs, from the simplest to the most elaborate drinking fountains are also given.





### Expanded Metal in Havana

THE use of Expanded Metal by the Engineer Department, City of Havana, dates from January, 1900, when it was adopted in the construction of the Vaccination Station, erected on the corner of Zuleta and Genio streets, at a cost of \$12,000. This building was a success. The claims which determined the use of Expanded Metal on the building, mainly rapidity of construction, minimum cost and



POLICE HEADQUARTERS—EXPANDED METAL USED IN ITS CONSTRUCTION

pleasing appearance obtained at a small cost, were fully borne out by the results obtained. The building has stood a test of two years in this climate, the results being entirely satisfactory. The use of Expanded Metal in construction was from this time on adopted wherever practical in the work in charge of the Engineer Department. Roofs, floors and septic tanks were built of the heavy metal and lighter metal replaced the thin brick wall and the wooden lath in nearly every class of building constructed or repaired.

Expanded Metal was used in the construction of the Administration building in connection with the city prison for the City of Havana, and large quantities of it were used in the remodeling of the old Hospital Militar into a modern school building; here the heavy metal was used in the construction of the floors, and staircases, and the light metal was used in panel walls, the plaster surface of which was easily made to conform in appearance with the surrounding masonry walls.

Expanded Metal was also used in the construction of the new court room at the Municipal Vivac, the structure being fire-proof throughout. Heavy Expanded Metal was used in forming the floors and roof of the building and light Expanded Metal was used in the construction of the walls. The heavy metal was also used in replacing the old wooden floors around the gallery with floors of concrete, spans between the iron beams supporting the new floor being 7 feet 6 inches. The most prominent result obtained in the use of Expanded Metal in this building was the successful manner in which the plaster placed over the metal was matched with the surrounding masonry, a very important point which must be taken into consideration in the construction of additions to masonry buildings in Havana.

In nearly all of the above mentioned places where Expanded Metal was used, the principal reason for its adoption was economy, and in many cases much saving to the Government was made, especially in the use of the heavy Expanded Metal in floor construction.

Expanded Metal was also used quite recently in the construction of

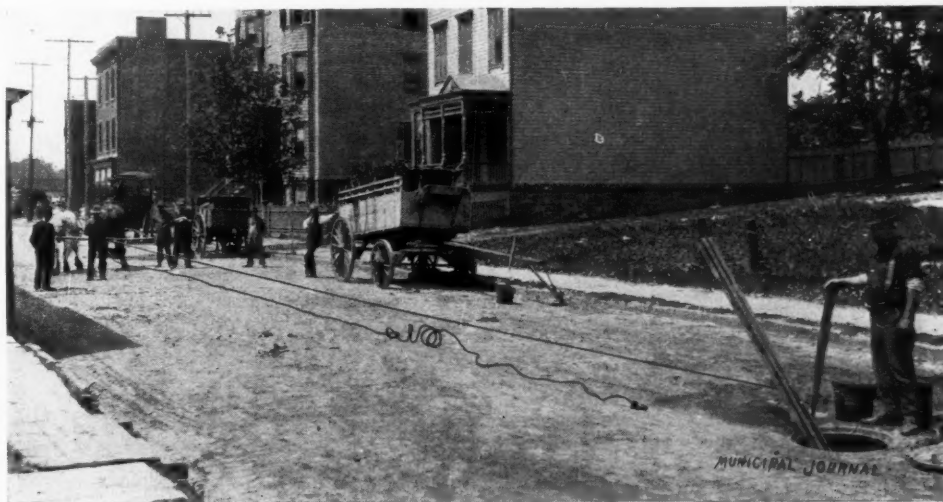
two lighthouses on the shores of Cuba. The contracts for the construction of these were performed by the American Bridge Co. This material has been used under similar circumstances also in Porto Rico.

### An Effective Sewer Cleaner

MAYOR FAGAN, of Jersey City, is one of the progressive chief executives of the United States. There were recently tried in his city one of the Connolly Patent Sewer Cleaners. This is the only device of its kind for which a patent has been issued by the United States Patent Office in twenty-one years. By the approval of Mayor Fagan it was recently tried in Jersey City. The accompanying illustration shows the department at work cleaning one of the main trunk sewers which had not been cleaned before in twenty-five years. A full description of this sewer cleaner was given in our July issue, page 43.

A member of our staff visited Jersey City and witnessed the machine at work on Garfield avenue, the street view shown in the illustration, and he reports that the device worked rapidly and efficiently. City Surveyor Smith, of Bayonne, N. J., writes: "The Connolly patent sewer cleaning device has been used in this city during the present year. Some 23,500 linear feet of sewers having been cleaned with it. The work was quickly and efficiently performed and at a cost much less than by any other method known to me." In reference to the trial of the device on one of New York's sewers located on Eleventh avenue, General Inspector of Swers Klein writes, to Mr. Connolly, the inventor: "When your force of men with machinery went to work and cleaned out one of our pipe sewers on Eleventh avenue, it seemed to do the work just as you stated as to time and system. I am not in a position to say just how it would do throughout the city where traffic would interfere to a certain extent; but on the whole, I would recommend it for a trial to those who have use for sewer cleaning." Further information relative to price, etc., can be secured from the owner, Mr. Michael Connolly, 238 Seventeenth street Jersey City, N. J.

NEW LIGHTING CONTRACT FOR ROCHESTER.—The Board of Contract and Supply of Rochester, N. Y., has awarded a

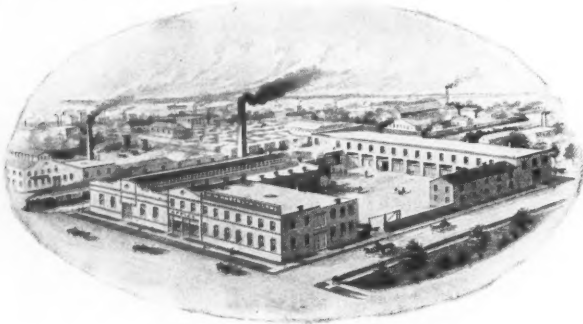


SEWER CLEANER AT WORK ON GARFIELD AVE., JERSEY CITY—THE SEWER HAD NOT BEEN CLEANED IN 25 YEARS

five year contract for lighting the city to the Rochester Gas and Electric Company. The company will use enclosed arc lamps, and the city will pay 21½ cents per night for a 2,000-candle power light, as compared with 25 cents a night under the previous contract. For 1,200-candle power lights 18¼ cents is to be paid as against 20 cents under the old contract. These prices will amount to \$78.50 per year for the larger lights, and \$66.61 for the smaller lights. Altogether the contract will aggregate \$1,059,694.

### Paving and Construction Tools

THE growth of the firm of W. H. Anderson and Sons has been as remarkable in the last thirty years as has been that of the paving industry. The business was established in 1871 by Mr. W. H. Anderson, the size of the first shop being eighteen by twenty feet. The plant has been enlarged five different times since its inception and now presents a remarkable contrast as compared with the small beginning thirty years ago, as will be seen in the accompanying illustration. In the beginning, the only products were stone cutters'



tools; now, they manufacture scores and scores of varieties of tools, machines, appliances, etc., among which are included general contractors' outfits for paving, sewer building and grading; railroad contractors' tools for track laying, ballasting, etc.; wheelbarrows of all kinds for handling stone, cement, etc.; artificial stone sidewalk tools; telephone and telegraph construction tools; also special iron work and apparatus used in outside construction of telephone plants. A large descriptive price list can be secured by addressing W. H. Anderson & Sons, 21 St. Auburn avenue, Detroit, Mich.

### Trade Publications

—The American Steel & Wire Company, of Chicago and a score of other cities, has issued a 50-page catalogue containing descriptions, illustrations, and price lists of various wire materials used in electric lighting and street railway work.

—If you want to read the cleverest advertisement that has been written in many a day, write to D. T. Edwards, B. T. M., C. H. & D. R. R. Co., Cincinnati, O., and ask for the booklet "On the Way to Michigan." It is worth reading, and you will thank us for calling your attention to it. Besides it tells where to go in Michigan to enjoy a cool vacation, how to get there, and the expense.

—"Metallic Furnishings *versus* Wooden" is the title of a booklet issued by the Art Metal Construction Company, in which it illustrates and describes, in an entertaining way, the uses of art metal furnishings for public libraries. It has issued several other booklets about the adaptation of the same kind of furniture for city halls and other public offices. The up-to-date city official will be glad to have these booklets to keep himself informed.

—The catalogue issued by the Consolidated Engine-Stop Company of 100 Broadway, New York, concerning their Monarch Automatic Engine-Stop System is designed to tell what the "stop" is, how it works and what it will do. Fine illustrations and drawings and a few concise sentences tell what it is; the descriptions accompanying the drawings explain clearly the operation and what is accomplished by the use of these appliances on engines. How well they fulfill what is claimed for them may be judged from the many testimonials from plants in which they have been installed. These "stops" should be installed in every municipal water or lighting plant. This catalogue will be of interest to managers of all such plants and may be had for the asking.

## NOTES OF INTEREST TO THE TRADE

—The Dixon Garbage Crematory Company, of Toledo, Ohio, has been awarded the contract for the construction of a garbage crematory at the United States Army Post, San Juan, Porto Rico.

—Mr. B. S. Barnard has resigned as Manager of Sales for the American Vitrified Conduit Company, and associated himself with the Standard Vitrified Conduit Company, of 39 Cortlandt street, New York City.

—Mr. G. M. Gest, the conduit contractor, has just received through his Cincinnati office, the contract for the underground work of the Bell Telephone Company of Cincinnati. This will amount to nearly 100,000 duct feet.

—At the next convention of the International Association of Fire Chiefs, to be held at the Grand Central Palace, New York City, commencing Sept. 16, 1902, the Eureka Fire Hose Co., New York, will make practically the same exhibit that was made at the Pan-American Exposition, Buffalo, N. Y., and for which it was awarded a gold medal.

—A. A. Knudson, of New York City, was recently called upon by Superintendent Dunbar, of the Bay City Water Works, to make an electrical survey of the water mains of that city in search of stray electric currents. Some damage to the water mains by electrolysis has already been detected, and the work of Mr. Knudson is to determine the extent of damage and to furnish a remedy.

—Owing to ill health M. H. McColm, who has been identified with the Eureka Fire Hose Company, New York City, for several years, has resigned his position with the Company to take effect July 15th. Mr. McColm has recently been in charge of the Boston, Mass., office and his many friends in that vicinity and elsewhere will regret to learn of his enforced retirement from active business affairs.

—The Ellithorpe Safety Air Cushion Co., 31-33 Broadway, New York City, has had an avalanche of applications for its air cushions for elevator shafts. Architects, engineers and owners of buildings have evidently taken warning from the recent unfortunate accidents and the numerous injuries and deaths incident thereto. They are

beginning to realize that it is cheaper to put in this safety device than to pay cost of damages.

—The town of Delmare Junction, Iowa, was doubly patriotic on the Fourth of July. It not only celebrated the "Ever Glorious," but also dedicated for public use a new acetylene gas plant. The generator supplying this town with acetylene light is of the measured feed self-cleaning type, operating automatically, and was furnished by the Abner Acetylene Gas Company of Chicago. This company makes a specialty of lighting small towns and villages with acetylene gas.

—Mr. T. Hugh Boorman, who returned from a flying trip to Europe last month, established while there a branch office in London for the sale of his California and Venezuela Bitumens. He also received the appointments of sole United States representative of the Callender's Bitumen Sheeting, and the Gordon Crystopal, both of which materials will now be manufactured in the United States. He obtained also the United States control of the products of the Brunswick Asphalt Mines of the Magdeburg Co. in Germany.

—The Wight-Easton Co., 160 Fifth avenue, New York City, reports having received an order for 630,000 feet of its lock-woven steel fabric. This, Mr. Wight said, was the largest single order ever given, which certainly speaks well for the above company, as the product has only recently been put on the market, being used for fireproof purposes, floors, roofs, partitions, bridges, piers, grill work, etc., and is approved by the Bureau of Buildings, New York City. The factory is located at Adrian, Mich.

—"Magnesialith" is one of the new fire-proofing materials which is attracting considerable attention in New York City. It is sometimes known as "magnesia building lumber." It is a strictly first-class substantial structural material, it being absolutely fire-proof. Its manner of construction makes it an excellent non-heat-conducting material. Its physical character enables it to be employed for a vast variety of uses, such as window-frames, doors, partitions, sheathing, shingles and weather boards. For further particulars and price list address Mr. Robert A. Keasbey, 83 Warren street, New York City.



# LATEST NEWS FOR CONTRACTORS

## Bids Wanted for Municipal Work—Franchises Granted—Contemplated Improvements— Contracts Awarded

### PAVING

Trenton, N. J.—It has been decided to pave East Hanover and N. Warren streets with asphalt or with Belgian blocks.

Cincinnati, O.—The City Engineer has been ordered to prepare plans and estimates for improving Fern and Main streets with asphalt.

Jersey City, N. J.—The Board of Boulevard Commissioners has stated that \$140,000 is needed to maintain the Boulevard for the coming year.

San Antonio, Tex.—It is contemplated to issue \$300,000 worth of bonds for asphalt paving and bridges. Assistant City Engineer J. D. Rullman.

Woburn, Mass.—The City Council has been considering a \$10,000 loan for highways.

Jersey City, N. J.—The freeholders of Hudson County have sold \$65,000 worth of bonds to be used in the construction of the Paterson plank road.

New Bedford, Mass.—The Council has passed an ordinance appropriating \$67,500 for highways and streets.

Schenectady, N. Y.—Bids are wanted about August 15 for sheet asphalt on College street. City Clerk.

Gainesville, Fla.—It was voted to issue \$20,000 in bonds for the erection of a city hall and paving.

Fulton, N. Y.—The Council is contemplating \$150,000 worth of brick and asphalt paving. City Engineer D. C. Breed.

Ashland, Wis.—Bids for asphalt paving were received as follows: Ellis avenue, Western Paving Co., Milwaukee, \$2.22 and 84 cents for Kettle River curb; Barber Asphalt Company, \$2.19 and Kettle River curb 80 cents.

Rome, N. Y.—As soon as plans are prepared 10,000 square yards of paving will be laid on one street.

Three Rivers, Mich.—The Council has been considering the issue of \$25,000 worth of bonds for paving.

Warren, Pa.—The issue of \$25,000 in bonds for street paving was carried at a recent election.

Toledo, O.—Bids are asked August 11th for the paving of Wabridge avenue with block. City Clerk Naus.

Boston, Mass.—The cost of paving Norfolk avenue with granite has been placed at \$10,500 by Superintendent of Streets Donovan.

Owosso, Mich.—Estimates will be asked by the Board of Public Works for a macadam or crushed stone pavement on Main street.

Toledo, O.—Bids are wanted August 11th for the paving of Union and Cherry streets with block. City Clerk Naus.

Redlands, Cal.—It is reported that bonds to the amount of \$50,000 have been sold for street improvements.

Centerville, Ind.—Bids are wanted August 24th for 40,000 square feet of cement or brick sidewalks. J. F. Frame, Engineer.

Lincoln, Neb.—Bids are wanted August 4th for the purchase of the \$215,000 paving and other improvement bonds. City Treasurer Fox.

Oneida, N. Y.—It is reported that bids will be received on August 4th for the purchase of \$20,000 in bonds for the paving of Main street and Lenox avenue and for \$5,000 sewer bonds.

Paoli, Ind.—It is reported that bids are wanted on August 4th for the building of 35,246 feet of macadam or gravel roads in Orangeville township. County Auditor Tegarden.

Verona, Pa.—It is reported that paving bonds to the amount of \$12,000 have been sold.

Albany, N. Y.—The Mayor has signed ordinances for the paving of Fulton and two other streets and for asphalt on a portion of Broadway. City Engineer Melius.

Winnipeg, Man.—It is reported that Young street will be asphalted at a cost of \$11,900. City Clerk C. J. Brown.

East Hampton, Conn.—At a recent town meeting the Selectmen were authorized to build a new highway north from Mill street.

Atchinson, Kans.—A resolution has been passed by the City Council for the paving of 10th street with vitrified brick. City Engineer Fred Giddings.

Mobile, Ala.—Contracts will soon be let for the laying of 30,000 yards of rock asphalt and 16,000 yards of brick laid on sand. Engineer J. N. Hazelhurst.

Rock Island, Ill.—An ordinance has been passed by the Council for the laying of asphalt on a portion of 21st street, to cost \$8,700. City Engineer Treichner.

Atlantic City, N. J.—State Road Comr. Henry I. Budd recommends the building of a stone road between Atlantic City and Pleasantville, to cost about \$150,000.

Watertown, N. Y.—The Barber Asphalt Paving Company made the only bid for the asphalt on Washington street, at \$1.98 per square yard.

Cincinnati, O.—The Board of Public Service has decided to pave several streets on Mt. Adams with brick and asphalt.

Rome, N. Y.—The Council has adopted plans for the paving of W. Embargo street with asphalt, macadam or brick.

St. Paul, Minn.—It has been estimated that the cost of paving Ramsey street with asphalt will amount to about \$22,000. Robert street will be paved with brick. City Engineer Rundlett.

Elizabeth, N. J.—Bids are wanted August 1 for 6,480 square yards of trap rock pavement in Livingston street. City Surveyor Luster.

Youngstown, O.—It is reported that bids are wanted on August 2nd for the paving of Holmes street and for the building of a sewer in Wilson avenue. Clerk C. E. Cross.

Menominee, Mich.—The City Engineer has been ordered to prepare plans for the paving of Main street with brick.

Pittsburg, Pa.—The proposition to improve the roads in several places has been approved by the Grand Jury.

Crookston, Minn.—Bids are wanted August 12th for asphalt paving to cost \$40,000.

Rock Island, Ill.—Property owners signed a petition for the asphalt of Fifteenth Street.

Holyoke, Mass.—Inquiries were made in June by the Board of Public Works relative to the cost of establishing a rock crusher plant.

Manistee, Mich.—The committee on paving will endeavor to dispose of \$125,000 paving bonds for which bids were rejected the last of May.

Oxford, N. Y.—A special election resulted in a vote to pave certain streets.

Jersey City, N. J.—The Street and Water Board has approved the specifications for the asphalt of Park Avenue, the paving of North Street and the improvement of Park Avenue. City Engineer Van Keuren.

Ocean City, N. J.—Bids will be taken in August for the paving of the streets with brick and macadam, for which \$78,000 was authorized.

Marshall, Mich.—The Finance Committee will appropriate \$5,000 to begin the paving on State street.

Toronto, Ont.—Notice has been given by the Council of its intentions to lay brick on Atlantic avenue, at a cost of \$5,400, and asphalt pavement on Dunbar Road at a cost of \$3,000.

Boston, Mass.—The authorities at Harvard are urging the building of a boulevard between the New Cambridge Park and Quincy Square to cost \$200,000.

Lowell, Mass.—A proposition to spend \$38,950 for asphalt paving has been voted down by the Council and macadam paving will probably be laid. Councilman Carmichael.

Hartford, Conn.—The question of the street railway company laying wood blocks between its tracks is still under consideration.

Allentown, Pa.—The Council is considering the paving of several streets with asphalt. City Engineer C. H. Marty.

Frederick, Md.—Plans for paving the streets will be prepared by T. C. Hatton, of Wilmington, Del. Mayor Smith.

Toledo, O.—\$50,000 is asked by the Park Board for a boulevard; \$4,000 for park work. Bids are wanted August 11 for paving Wabridge avenue. City Clerk Charles T. Naus.

Centerville, Ind.—Bids will be received August 24 for 40,000 square feet of cement or brick sidewalks. Edw. King, Clerk.

Lincoln, Neb.—Bids are wanted August 4 for \$215,000 worth of paving and improvement bonds. City Treasurer Fox.

Mill Valley, Cal.—Will soon vote on the question of issuing \$40,000 in bonds for paving and sewers.

Detroit, Mich.—The aldermen have voted to establish the city asphalt plant so long under consideration.

Leavenworth, Kans.—A petition has been in circulation for some time asking for the paving of Broadway at the general expense of the city.

Oelwein, Iowa.—The Council has passed a resolution for the laying of permanent sidewalks in the city. C. R. Brown, Mayor.

St. Paul, Minn.—About three miles of new pavement have been laid so far and at least one mile more is to be put down this year. Asphalt comprises the greatest amount of pavement, and sand stone comes next.

Baltimore, Md.—The engineers of the Maryland Geological Survey have been inspecting the roads about Cumberland to lay out the good roads that the county has voted. Other parts of the state are to be improved in this respect.

Toronto, Ontario.—After a visit to New York, City Engineer Rust reported to the Council in favor of an asphalt plant, and the Council authorized the expenditure of \$23,000 for this purpose.

Hamilton, O.—The Circuit Court has handed down a decision on account of which all street paving in the city will be suspended for an indefinite period.

Trenton, N. J.—The Court of Errors and Appeals has decided in favor of the city in the case brought by it against Aaron Ward & Co. for a default in asphalt paving on Federal street.

Perth, Ont.—The Lanark County Council has decided to raise a loan of \$65,000 for the purpose of constructing a system of good roads throughout the county. Address County Clerk John A. Kerr.

Toledo, O.—Sealed bids will be received August 11, for furnishing the necessary labor and material for the paving of Twenty-sixth street to the centre of Wabridge avenue with one of the several makes of paving, brick or asphalt block. It is to be a six-inch concrete foundation. City Clerk Charles H. Naus.

Perth, Ontario.—It is reported that \$65,000 worth of bonds were issued by the County Council for building county roads.

Des Moines, Iowa.—It has been proposed to pave several streets with brick. Mayor J. M. Brenton.

Syracuse, N. Y.—City officials are considering having a considerable amount of paving done this year, and all the preliminary work of preparing the streets will be rushed.

Montreal, Quebec.—The Montreal Silicate Brick Co. has been incorporated and will erect a plant in Montreal for the manufacture of building and paving brick. The officers are David Robertson, President; George J. Shepard, Vice President and Managing Director.

Toronto, Ont.—Acting City Clerk Sanderson has given notice that after July 30 the following improvements will be made: \$13,355 worth of macadam roadway; concrete sidewalks on fifteen streets, aggregating \$15,838; 12-inch tile pipe sewer on Gerrard street with manholes, four gullies, and fifty private drain connections, aggregating \$1,310; a 14-foot asphalt and paving block pavement on Yonge street, to cost \$26,000; a 24-foot asphalt pavement on Castle avenue and Walmer Road to cost \$15,590.

### LIGHTING

Dunn, N. C.—Plans for water works and an electric plant have been prepared by John W. Hayes, of Petersburg, Va.

Lenoir, N. C.—The Lenoir Electric Company has been incorporated with a capital of \$50,000, to build an electric plant, etc. G. L. Benhart is the manager.

Cynthiana, Ky.—The Cynthiana Electric Light Company has increased its capital from \$33,000 to \$50,000 for the purpose of enlarging its plant.

Westerly, R. I.—At a recent election it was decided by the citizens that they would build and own an electric light plant. \$2,500 was also voted for the purchase of a stone crusher.

Racine, Wis.—The City has decided to sell to the highest bidder a franchise for a municipal heating plant, and the city clerk has been soliciting proposals.

Kansas City, Mo.—The election to vote on the bonds for a municipal electric light plant having resulted in the defeat of the proposition, the Kansas City Electric Light Co. has offered to light the streets of the city at the actual cost of producing the light together with a fair allowance for depreciation. At the present time the city is paying \$82.50 per year for arc lights on all night schedule.

Waco, Tex.—The City Council has adopted a resolution directing the preparation of an ordinance appropriating \$300,000 to purchase a water works and electric light plant to be owned and controlled by the city.

McRae, Ga.—At a recent election it was decided that bonds are to be sold for the installation of electric lights and water works.

Manchester, N. H.—Estimates have been made for an electric plant at Goffstown, by Civil Engineer Allen, of Head & Dowst, engineers.

Binghamton, N. Y.—It is reported that an independent electric plant will be built by the company in which Cornelius H. Ackerman is interested.

Niagara Falls, N. Y.—The Niagara Falls Gas and Electric Co. have applied for a franchise for furnishing La Salle and neighboring places with electric light and gas.

Annapolis, Md.—Plans have been prepared by Baldwin & Pennington, of 44 South street, Baltimore, Md., for a central heating and electric light plant to cost \$150,000.

Baltimore, Md.—It is proposed to build a power house to cost \$30,000 for the Women's College of Baltimore. Rev. J. F. Goucher, president.

Dallas, Tex.—The city has brought suit against the Standard Light and Power Co. for the forfeiture of its franchise on the ground that a combine has been formed, and that outside interests are controlling the company contrary to its charter.

Summit, N. J.—The experience of Madison in owning its water and light plants, has started a movement for the ownership of these utilities in this place, and a committee has been selected to investigate the question.

Parkersburg, W. Va.—The Hocking Valley Gas Company has permission of the Council to pipe natural gas through the streets.

New Haven, Conn.—The New Haven Gaslight Company will issue \$750,000 worth of bonds to be used in extending the system.

Indianapolis, Ind.—The Board of Public Works will receive bids until August 15th for lighting the streets of the city for ten years. New specifications have been prepared.

Blairtown, Iowa.—A franchise has been granted G. W. Pardey for an electric light plant.

Syracuse, Neb.—A. Wait and H. Glarsson, village trustees, have been considering the building of an electric light plant.

Weiser, Idaho.—The contract let H. V. Gates, of Hillsboro, Ore., for an electric light plant, has been declared void, and on July 31 the city will vote on the question of building a plant.

Bowling Green, O.—The County Commissioners are considering the question of installing a heating, lighting and power plant.

Grand Island, Neb.—City Engineer C. A. Baldwin reports that nothing will be done toward securing a municipal electric light plant until next spring, when a vote of the people will probably be taken in the matter.

Dalton, Ga.—A contract was let the Standard Electric Company, of Charlotte, N. C., for an electric light plant, at \$10,685.

Pinkneyville, Ill.—At an election held in July the proposition to grant a franchise for electric lighting was defeated. The Council has decided to put in an electric light plant to cost \$10,000 and bids will soon be wanted.

Kirkwood, Ill.—A franchise has been granted by the village board to Clifford West, of Biggsville, for an electric light plant for this village.

Lead, S. D.—A franchise has been granted by the Council to the Dickinson-Ames Co. for a gas plant.

Columbus, O.—The ordinance granting a franchise to the East Columbus Heating and Lighting Co. has been approved by Mayor Hinkle.

Annapolis, Md.—As soon as plans and specifications are prepared bids will be asked for the central heating and electric plant. Baldwin & Pennington, 44 South street, Baltimore, are the architects.

Webster City, Ia.—It is reported that the Council has appropriated \$5,000 for constructing a municipal heating plant.

Boulder, Col.—It has been voted by the Boulder Electric Light and Power Co., to issue \$160,000 in bonds. New engines and dynamos are to be purchased.

Carthage, Mo.—The Council has been petitioned by D. C. Brainard for a franchise for a gas plant.

Eminence, Ky.—The city franchises for electric light and electric railway have been bought by J. C. Hepburn and others.

Verndale, Minn.—Plans for an electric light plant have been prepared by O. Claussen, of St. Paul.

Davenport, Wash.—C. O. Green has petitioned the Council for a franchise for an electric light plant, according to reports.

Fremont, O.—The Council has been petitioned by the Logan Natural Gas Co. for permission to lay pipes and supply gas to the residents of Fremont.

Shenandoah, Ia.—It is reported on local authority that the citizens have voted to grant a franchise for a gas plant to a Mr. Hayes and others.

Belzoni, Miss.—It is reported that bids are wanted about September 15th for the construction of an electric light and power plant.

Petersburg, Ind.—Bids are wanted by the Clerk of the Town Trustees, Frank Thomas, for the construction of an electric light plant.

Helena, Mont.—It is reported that the Helena Light and Traction Co. has been incorporated. The company will construct railways operated by electricity between several neighboring towns. The capital is \$100,000. Thomas A. Marlow, of Helena, is one of the directors.

St. Francisville, La.—An election will be held by the city to vote on the issue of \$10,000 for the construction of water works and an electric light plant. Address "The Mayor."

Bennettsville, S. C.—The city will put in a complete steam driven electric light plant. Collier & Brown, Atlanta, Ga.

Elkton, Md.—The Elkton Gaslight Company will erect its proposed new holder with a capacity of 25,000 feet, and make other improvements.

Tusculum, Ala.—A franchise was let K. W. Worthington, of Sheffield, Ala., for an electric light plant and also for the construction of water works.

Hartwell, Ga.—The city has decided to build a water works and an electric light plant. Address Mayor W. J. Johnson.

Augusta, Ga.—The Augusta Railway and Electric Company will construct a new electric light plant if it succeeds in renewing the contract with the city now pending.

Antioch, Cal.—The franchise that was recently let H. Beede for an electric plant has been transferred to J. H. Lawrence, of Oakland.

Los Angeles, Cal.—Supplies for the proposed power plant on the Kern River, which the Edison Electric Company is building, will be ordered by D. A. MacGilloray, Purchasing Agent of the Company. Fred C. Finkle is the chief engineer.

Pinkneyville, Ill.—It is reported that the Council will soon ask for bids for an electric light plant to cost \$10,000. J. C. Hamm is Clerk.

Washington, Ia.—It has been voted here to build an electric plant, and plans will be prepared by Prof. G. W. Bissell, of Ames, Ia.

Sauk Rapids, Minn.—It is reported that A. G. Whitney, who recently obtained the water rights here, is making arrangements to build a power plant to cost in the neighborhood of \$100,000.

Winona, Minn.—The Council Committee has recommended that the city defer the building of an electric light plant until a later date, and that at present a contract be made with the Winona railway and Light Company for five years. O. McCullough is chairman of the committee.

Butte, Mont.—New bids will probably be asked by the County Commissioners for an electric light plant in the Court House to cost \$6,000.

Danville, Ky.—A committee has been appointed to investigate the building of an electric plant. Dr. J. C. Bogle and W. G. Dunlap are on the committee.

Indianapolis, Ind.—It is reported that Governor Durbin is desirous of having an electric light plant built for the state house to cost \$100,000.

Joliet, Ill.—It is reported that a company is being organized in Chicago to build a power plant in South Joliet to cost about \$1,000,000. Charles A. Monroe, 184 LaSalle street, Chicago, is interested in this project.

Corinth, N. Y.—A proposition has been before the Council to contract with the Corinth Electric Light Company for lighting the streets of this place.

Oneida, N. Y.—The Board of Public Works has been directed to secure estimates for a municipal lighting plant.

Winnsboro, N. C.—A recent special election in this place resulted in a vote to issue \$10,000 in bonds for an electric light plant.

New Decatur, Ala.—A franchise has been granted J. T. Cross, Chattanooga, Tenn., for an electric light plant and street railway, the construction of which is to commence within six months.

### PUBLIC BUILDINGS

Tifton, Ga.—The city will erect a \$10,000 school. "The Mayor."

Lewisville, Tex.—The city will erect a school building. Address "The Mayor."

Anderson, S. C.—A \$10,000 school building will be erected by the city. "The Mayor."

Athens, Ga.—The City Engineer is preparing plans for the proposed \$30,000 city hall. "The Mayor."

Freeport, Ill.—Sealed proposals are asked for August 6 for the installation of the conduit and electric wiring system of the U. S. Post Office. Bids, August 13th, for the heating apparatus. James K. Taylor, Treasury Building, Washington, D. C.



Cromwell, Ia.—On August 9 sealed bids will be received for the erection of a school building. M. W. Purviance, Secretary.

Fergus Falls, Minn.—Bids are wanted August 18 for the building of a U. S. Court House and Post Office at this place. James K. Taylor, Treasury Building, Washington, D. C.

Benton, Ark.—Plans and specifications for the new court house which will be erected here are on file with M. H. Holleman, County Commissioner. It will cost \$30,000.

Hot Springs, Ark.—Sealed bids are asked for August 14, for the installation of a conduit and wiring system for the post office at Hot Springs. James K. Taylor, Treasury Building, Washington, D. C.

Sacramento, Cal.—A special election was held July 22 to decide on the proposition to issue bonds to the amount of \$150,000 for a high school.

Victoria, B. C.—The offer of Carnegie for a \$50,000 public library has been accepted.

Winthrop, Mass.—It is reported that bids will be received up to August 7 for constructing a brick hospital at Fort Banks. Address A. W. Chase, Quartermaster.

Niagara Falls, N. Y.—The plans for the Carnegie library have been approved and proposals for its construction will be opened on August 5. The building will cost about \$50,000.

Syracuse, N. Y.—Steps have been taken by the Court House Committee for a site for the proposed new court house. It is hoped that work on the building can be started this summer.

Utica, N. Y.—The Court House Commission is in negotiations with architects for securing a plan for the new court house building. Prof. William R. Hare, of Columbia University, is the consulting architect.

Paterson, N. J.—Bids for repairs to the city hall have been rejected by the Board of Aldermen. The work was estimated to cost \$200,000.

Greensburg, Va.—Bids will be asked by the County Commissioners for the building of a court house.

Hattiesburg, Miss.—Plans have been prepared for a new school house.

Marquette, Mich.—On August 6 bids will be received for the erection of a county court house. William A. Ross is the County Clerk.

Toledo, O.—It is reported that the Council has decided to issue \$20,000 in bonds for a smallpox hospital.

Yonkers, N. Y.—It is stated that the lowest bid for erecting the Carnegie library was made by W. H. Sargent, at \$46,945.

Anderson, Ind.—The plans of Richards, McCarty & Bulford, Columbus, O., have been accepted for the Carnegie library, which is estimated to cost \$50,000.

Schenectady, N. Y.—Local press reports state that \$35,000 has been given the Ellis hospital for the erection of an annex.

Harrisburg, Pa.—The plans of Architect Hutton for the new State Capitol have been approved by the Capitol Commission and bids will be let for its construction.

## WATER WORKS

Troy, N. Y.—It is reported that \$400,000 worth of water bonds have been sold.

Springdale, Ark.—Bids are wanted August 1st for the construction of water works. C. J. Chapman, Sec'y Water Works Commission.

Battle Creek, Mich.—A committee has been appointed by the Board of Works to investigate the installations of a filter for the water supply, to cost in the neighborhood of \$30,000.

Buffalo, N. Y.—For the purpose of making extensive improvements, the Western New York Water Company has been mortgaged to the amount of \$10,000,000. W. B. Cutter, President.

Richfield, Utah.—It has been decided by the Council to levy a tax of 1 per cent. for the construction of water works, which will cost \$18,000.

Covington, Tenn.—An engineer has been employed by the town to estimate the value of the plant of the water works company. He has placed the value at \$10,300.

Niles, O.—Bids are wanted August 14th for a well twenty-five feet in diameter, to cost about \$5,000. S. F. Bycraft, President Water Works Trustees.

Milton, Mass.—At a recent town meeting it was voted to purchase the property of the Milton Water Company for \$315,000.

Manchester, Va.—The Council has appointed a committee to consider a plan for purifying the present water system. J. T. Abbott is a member of the committee.

Bedford, Mass.—At a recent election it was voted to issue \$100,000 in bonds for the construction of water mains.

Avon, S. Dak.—It is reported on local authority that a system of water works to cost \$5,000 will soon be installed.

Worthington, Minn.—The Council has been considering improvements to the water works and electric light plant.

Ruthon, Minn.—At a recent special election it was voted to build a system of water works.

Manning, Ia.—A 60,000 gallon steel water tower one hundred feet high has been designed by Prof. Marston, of Ames, Iowa.

Worcester, Mass.—An order has been adopted by the City Council for the placing of water pipes in Quinsigamond avenue, at an estimated cost of \$23,300.

La Junta, Col.—Plans for the improvements of the water works has been under consideration by the City Council.

Hartwell, Ga.—It has been decided by the authorities to erect water works and an electric light plant as soon as possible. Mayor W. T. Johnson.

Waynesboro, Pa.—The Water Works Company will make extensive improvements, including the construction of a dam and reservoir.

Portage, Wis.—The Council has voted to extend the water mains at a cost of \$3,500. C. Lauterbach, Chn.

Prairie du Chien, Wis.—This place, according to reports, voted to build water works to be completed by November 1st.

Burlington, Ia.—An injunction has been issued by Judge Witbrow restraining the city from issuing \$400,000 in bonds for the purpose of extension of the water works.

Geneva, Neb.—The question of installing water meters is under consideration.

Mt. Pleasant, Tex.—Correspondence is desired with contractors of water works machinery, as this place intends to build. "The Mayor."

Lind, Wash.—A twenty years' franchise for water works, to cost \$12,000, has been granted to Nelson Brothers.

Richfield, Utah.—The Council has voted to install water works to cost \$20,000.

Ottawa, Ont.—The Council is considering a proposition to furnish Clarks town with a water supply. Councilman James Davidson.

Whitby, Ont.—The question of installing water works is under consideration.

Shenandoah, Va.—The city will vote on August 5th on the issue of \$20,000 worth of bonds for the building of a gravity water works system. "The Mayor."

Springdale, Ark.—Bids will be opened August 1st for the construction of a complete water works system. The plans are on file with C. J. Chapman, Secretary of the Water Works Commission.

Biloxi, Miss.—Plans will be prepared by Kirkpatrick & Johnson, of Jackson, Miss., for the proposed water works for the city.

Fayette, Miss.—The city will spend about \$15,000 for building water works. C. H. Jenks, of St. Louis, Mo., Engineer in Charge.

Meridian, Miss.—A plant has been purchased for a reservoir and the Council will order an election to vote on a bond issue of \$200,000 to construct the system. "The Mayor."

Pickards, Miss.—On August 1st the city expects to sell \$6,000 worth of water bonds for the purpose of constructing a system. J. F. Wilburn, Town Clerk.

Montpelier, Vt.—An increased water supply is being considered by the city. Supt. Foster.

Middleport, N. Y.—A franchise for water works has been asked by F. A. Dudley and W. C. Johnson, of Niagara Falls. It is to be operated in connection with the Middleport Electric Light Company plant.

Yonkers, N. Y.—Bids are wanted August 11 for a horizontal high-duty pumping engine of 8,000,000 gallons capacity. Three hundred and thirty-five lengths of 24-inch cast-iron water mains and twenty tons of special castings are also desired. A. W. Kingsbury, Clerk of Board of Water Commissioners.

Winchendon, Mass.—\$2,000 has been appropriated by the town for the laying of new water mains.

Phoenix, R. I.—Plans for the new reservoir for the Phoenix Valley Water Company have been completed. It is estimated that there will be 37,600 cubic yards of earth filling, 2,284 cubic yards of riprap; 126 cubic yards of stone aprons; 2,205 cubic yards of concrete; 1,025 cubic yards of rubble masonry. J. A. Latham, Providence, is the engineer.

Bedford, Wis.—This place has voted to issue \$10,000 in bonds for water works.

Springfield, Ill.—A report has been submitted by G. W. Mead, of Chicago, recommending the construction of a filtration plant at a cost of \$103,000.

Campdown, Pa.—The question of building water works is being considered by this place.

Yardley, Pa.—Bids are wanted August 5th for a water works at this place. T. S. Cadwallader, President, Yardley Water & Power Company.

Millville, Pa.—The property of the Bennett Water Company has been purchased by this place for the sum of \$68,000.

Washington, D. C.—On August 12th bids will be received for excavation, grading, masonry, water pipe, etc., for the Washington Aqueduct. Lieut. Col. A. M. Miller, U. S. Engineers, 2728 Pennsylvania avenue.

Benwood, W. Va.—The question of putting in a better water supply is being considered by this place.

Indianapolis, Ind.—Plans for the new filtering beds of the Indianapolis Water Company are completed and work will begin at once. The capacity of the works is to be increased from 35,000,000 to 65,000,000 gallons a day.

Henry, Ill.—The proposition of the National Construction Company, South Bend, Ind., for an air lift pumping system for the new works has been accepted by the Council. For \$8,000 the company will furnish two 20-H. P. gasoline engines, two pumps of 300,000 gallons capacity each, and two iron tanks of 15,000 gallons capacity. Bids will be asked later for the laying of five miles of mains, with hydrants, etc.

Hamilton, O.—Engineer Dabney T. Maury, Peoria, Ill., has been consulted by the authorities of Hamilton and has advised that \$110,000 be spent in extensively remodelling the city water works. This will include new pumps, a new intake and new supply basins.

Wilkes-Barre, Pa.—The Susquehanna Water Company has been reorganized with a capital of \$500,000, and plans contemplate the construction of a reservoir near this place. S. M. Nash, of Wilkes-Barre, is one of the company.

Cohoes, N. Y.—The Water Board is considering the purchasing of a steam pump to cost about \$15,000 and to have a capacity of 5,500,000 gallons.

Cornwall, Canada.—A recent election resulted in favor of raising \$11,000 to instal a new hydraulic plant to water works, and \$10,000 to put in the proposed extensions.

Gueydan, La.—The Gueydan Water Works & Power Co. has been chartered. W. L. Doss is president.

Penn's Grove, N. J.—A vote will be taken August 5, on the issue of \$35,000 in bonds for water works and an electric light plant, the water to come from the Delaware River. S. C. Hatton, Engineer, Wilmington, Del.

Pittsfield, Ill.—The Pittsfield Electric Light Company, after investigating a system of water works has submitted a proposition to the Council. It is proposed to put in a system of works, hydrants, and extend the water mains to all parts of the town for the sum of \$1,700 per annum. W. F. Keeny.

Chase City, Va.—A meeting was recently held by the citizens of this place to devise some means of establishing a system of water supply by artesian wells, or other wells. The committee was instructed to appear before the Town Council to ask for an election to decide whether bonds should be issued for this work.

McKeesport, Pa.—Bonds to the amount of \$70,000 have been authorized; \$25,000 to be used for water system, \$20,000 for a municipal building, \$6,000 for the fire department.

Shenandoah, Va.—This place will vote August 5 on the question of issuing bonds for \$20,000 gravity works, the water to be brought five miles.

Memphis, Tenn.—The American Water & Guarantee Co., Pittsburgh, Pa., has offered to purchase the local water plant if it can secure a long time contract from the council, embracing the plant, with universal meter, with a minimum rate of \$12.00 a year and 25 cents per thousand gallons.

Syracuse, N. Y.—The State Department of Health has investigated the conditions in the village of East Syracuse and urged it to secure a water system. The plans involve an expenditure of \$55,000 and will be decided upon by vote.

Pittsburgh, Pa.—Director of Public Works McCandless has estimated that the cost of a new filtration plant will amount to \$3,500,000.

Oakland, Md.—The Mountain Lake Water Co. has offered to establish water works and to furnish water at the same rates as the city of Pittsburgh.

Johnstown, O.—Bonds to the amount of \$12,000 will be sold on August 2. J. H. Mattingly has the specifications for the stand-pipe, etc. H. B. Ruslin, Mayor.

Lorain, O.—The Council has recently voted to issue \$32,000 in bonds for improving the works. City Clerk J. J. Mahoney.

Springfield, Ill.—The question of spending \$50,000 for a filter plant for the water works has been under consideration.

Dyersville, Iowa.—This place has been considering the question of building water works.

Egan, S. D.—It was recently decided to hold an election to vote on the question of installing water works.

El Paso, Tex.—Steps have been taken to form a company for the purpose of building new water works to cost about \$500,000. Address Alfred Courchesne, County Commissioner.

Youngstown, O.—The water works trustees intend to establish an experimental filter to test the water of the Mahoning River.

Trenton, O.—A report has been submitted by C. D. Lewis, of Greenville, O., for the establishment of a water works system.

Lewisville, Idaho.—Articles of incorporation have been filed by the Little Feeder Canal Co., Ltd.

New Albany, Ind.—The right has been granted the Indiana Water Company to pump water from the river instead of from wells.

Brooklyn, N. Y.—Plans have been prepared by Assistant Chief Engineer Van Buren, for a 36-inch water main on Atlantic avenue to cost \$60,000.

Golden, Col.—A proposition is before the citizens for the construction of a new gravity system of water works. The proposition to issue water works bonds was carried at a recent election.

Whatcom, Wash.—It is reported that bids are wanted August 3 for \$60,000 worth of bonds to be used in extending the water works. Mayor E. E. Hardin.

New London, Conn.—It is reported that a high service water works system to include water power pump, small reservoir, is under consideration, the whole to cost \$25,000. W. H. Richard, Engineer Water Department.

Monticello, Minn.—A vote was taken on July 29 on the issue of \$10,000 worth of bonds for water works and \$4,000 worth of bonds for a gas plant. W. J. Thompson, Recorder.

Washington, D. C.—The project of Col. A. M. Miller for the completion of the filtration plant has been submitted. This includes a filter plant of 75,000,000 gallons daily capacity. The available appropriation is \$600,000.

Munhall, Pa.—An ordinance was passed by the Council authorizing the issue of \$75,000 worth of bonds, \$25,000 of which is to be used for a water system and \$20,000 for a municipal building.

Birmingham, Ala.—The Birmingham and Suburban Water Works Co. has been incorporated with a capital of \$2,000,000. A water works system will be constructed in Birmingham and other near-by towns. Both electrical and other kinds of pumping stations are to be installed and water mains are to be laid. The following rates are to be charged: 6,000 gallons a month at \$1 a month, payable quarterly. Quantities in excess of 6,000 gallons a month to 5,000 gallons a day at the same rates. In excess of 5,000 gallons daily the following prices will prevail: 25,000 gallons at 8 cents per thousand gallons; 35,000 gallons at 7 cents per thousand gallons; 50,000 gallons at 6 cents per thousand gallons. Meter rates in excess of 6,000 gallons per month, except for domestic purposes, are as follows:  $\frac{1}{2}$  inch meter, \$3 per annum;  $\frac{3}{4}$  inch meter, \$5 per annum; 1 inch meter, \$7.50 per annum;  $1\frac{1}{2}$  inch meter, \$12 per annum; 2 inch meter, \$15 per annum.

### SEWERS

Orange, Tex.—A franchise for sewers was asked by W. D. Bettis.

Newark, N. J.—The joint sewer commission received bids for the fourth section of the trunk sewer as follows: Earle & Dougherty, Jersey City, \$51,654.40; William Hanna, East Newark, \$61,959.25; Batt & Martin, South Orange, \$60,

016.20; The Harrison Construction Co., of Newark, \$54,967; David Peoples Co., of Philadelphia, \$53,794.

Bloomington, Ill.—Plans for the drainage system in French Creek special drainage district, have been prepared by James Melliush. The work is to be done in the winter. There will be a ten mile main ditch, from which will extend about ten miles of lateral open ditches and tiles. The total cost of the work will be \$20,000.

Wheeling, W. Va.—The Council has outlined much work on streets to be done during the rest of the year. The total amount appropriated was \$24,087 and will include extension to sewers, grading and curbing and paving streets.

Los Angeles, Cal.—The Nome Ditch Company has been incorporated with a capital of \$25,000 by B. L. Harding and C. A. Summers, and a suburban water company with a capital of \$30,000, by Arthur L. Hawes and others.

Quincy, Mass.—The Council recently decided to build sewers to cost \$60,000 and a school building to cost \$55,000. Mayor Bryant.

Buffalo, N. Y.—Plans for the Hamburg Canal sewage pumping station have been prepared. C. W. Morse, Deputy Eigr. Comr.

Ardmore, Pa.—Bids are wanted August 4 for forty-one miles of pipe sewer and a sewage disposal and pumping station, to cost in all about \$185,000. W. E. Barrett, Chairman of the Com.

York, Pa.—Plans for a new sewerage system are under preparation.

Newberry, S. C.—This place has been considering the question of building a sewer system to cost \$40,000.

Canton, O.—Bids are wanted August 4 for fifteen miles of sewers, to be let in three sections. City Engineer P. H. Weber.

Abilene, Kans.—Bids for all but the first section of an outlet sewer into the Smoky Hill River will be let soon. The contract for the first section was let in July.

Camden, N. J.—Plans will be prepared by City Engineer Farnham for sewers for the Line Ditch meadow. The cost is estimated at \$75,000.

Lima, O.—Sewer Bonds have been sold by the City Council to the amount of \$50,000.

Quincy, Mass.—\$60,000 has been appropriated by the Council for sewer extensions. H. Flood, City Engineer.

Jeffersonville, Ind.—Bids are wanted August 5 for a sewer 804 feet long, composed of 24-inch tile pipe, double strength, with three manholes and four catch basins. City Engineer Victor W. Lyon.

Abilene, Kans.—Bids are wanted August 6 for a system of public and district sewers.

Cincinnati, O.—Specifications for a \$11,000 trunk sewer have been approved by the Board of Public Service.

Hicksville, O.—The Council has decided to construct a sewer about 5,700 feet in length.

Ardmore, Pa.—Bids are wanted August 4 for forty-one miles of pipe sewers, sewage disposal and pumping plant. W. E. Barrett, Chairman of the Com.

Morgantown, W. Va.—Sewer and paving bonds to the amount of \$30,000 have been sold by the city.

Long Branch, Cal.—Competitions have been submitted to the City Trustees for the building of a sewer system.

Lancaster, Wis.—A sewer system will shortly be laid out.

Marshall, Wis.—It has been decided by the City Council to issue \$35,000 in bonds for a sewerage system.

Greensboro, N. C.—An engineer has been engaged by the city to give his opinion regarding the improved sewerage works, to consist of intercepting sewers and disposal works.

Mayfield, Ky.—It is reported that \$50,000 was voted by the Council for a sewer system.

Oakland, Cal.—Plans for a sewer for the eastern district have been prepared by City Engineer Turner, to cost \$10,700.

St. Charles, Mo.—The City Engineer will prepare plans for a sanitary sewer system.

Batavia, N. Y.—Plans for a new sewerage system are being considered by the city.

Mt. Pleasant, Pa.—At a recent election it was voted to complete the sewer system at a cost of \$16,000.

Bellevue, O.—The Sewer Committee of the Council recommends the building of two trunk sewers, to cost \$25,000.

Massilon, O.—The Council has been advised by the Sewer Committee to build a sanitary sewer for Duncan and Walnut streets.

Northampton, Mass.—The Sewer Commissioners will petition the city government for \$50,000 to build sewers.

Williamsport, Pa.—The Council has decided to provide \$81,000 for the building of the Grafins run sewer.

Pittsburg, Kans.—Bids are wanted August 2nd for constructing 12,960 feet of 18-inch, and 37,500 feet of 50-inch sewers. City Clerk Bumgarner.

Plainfield, N. J.—Bids are wanted August 4th for building a sewer system in Arlington avenue; 600 feet of 30-inch, 2,320 feet of 24-inch, and 560 feet of 12-inch will be required. James T. McMurray, City Clerk.

Trenton, N. J.—Bids are wanted August 5th for a sewer in Second street. City Clerk C. E. Murray.

Waverly, Ia.—Bids are wanted August 5th for an 8-inch vitrified pipe sewer. City Clerk F. H. Munger.